THE GAS JOURNAL

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EDITORIAL NOTES

The Unremunerative Consumer

A PROBLEM of major importance to the Gas Industry is how to translate the unremunerative consumer into a paying proposition. It has been discussed for two or three years now, but it needs still greater ventilation. The obvious solution is the imposition of a minimum charge, but the Board of Trade set their face against the suggestion and the new legislation will not allow it. This means, of course, that two-part tariffs—or any other form of multiple tariff—must remain optional. It can be argued, and with justification, that a minimum charge would inevitably result in bad feeling against an Industry which has done so much to create goodwill. At the same time, it is by no means just that one set of consumers should help to support a very large percentage of the total consumers on gas undertakings' books; and it must be remembered that the unremunerative consumer is not necessarily among the poorer classes. From some quarters we have had evidence of what has aptly been described as an alarming state of affairs. On several occasions we have urged gas undertakings to take stock of the number of non-paying consumers, for the simple reason that by so doing they would become aware of the necessity of bringing into force some method of charge which will be a real inducement to increased use of gas. While saying this we realize that in practically every undertaking there are people living in such straitened circumstances that there is no hope of making them remunerative. If the price of gas were reduced to these consumers the money saved would not be spent on more gas. This is, however, no reason for not introducing attractive tariffs.

Certain attempts to introduce multiple tariffs have failed because of two reasons: The high rate for the first block and the fact that, before the consumer could obtain any relief, his consumption had to be very considerable. Even then the relief offered was too small really to attract business. The success of any multiple tariff depends, we think, in quick relief after a relatively small consumption. Only in this way can there be a levelling-up of the consumption, and it does imply in general a fairly high charge for the first block. This in itself is, of course, an obstacle in endeavouring to persuade the unremunerative consumer to abandon the flat rate, and many believe that the price of the first block is apt not only to frighten remunerative consumers but to be regarded by them as being actually the price of gas charged to them. We think, however, that too much importance can be attached to this idea. The block system is simple, easily understood, and gives its benefits to the economic consumers.

A "Dead Cert"

ONE thing is certain. "Before long, by pressure of circumstances, there will be introduced up and down the country numerous tariffs, many of which will not be scientific, but expedient, dictated by competition, because attractive terms must be offered more generally." We quote from Mr. Ridley's contribution to the discussion on the paper by Mr. Curtis, of Macclesfield, at the Institution meeting. It is obviously difficult to devise any system of gas charging which could with advantage be universally applied. It is, in fact, undesirable to attempt to do so. Each undertaking must consider its own circumstances and decide what system is most suitable in its own area. It may be a good plan to have more than one method of charge in addition to the flat rate charge which is essential. Several electricity undertakings have as many as half-a-dozen systems, and in no two systems is the cost the same for a like quantity of current. And this is apart from special individual contracts. On the other hand, Mr. Briggs, of Dudley, referring to the fact that the National Gas Council is at present collecting information of the actual methods now being employed by gas undertakings, expressed the hope that, on completion of this task, an authoritative committee should consider the matter, to prevent an undue increase in the number of methods. While admitting that the conditions of gas supply vary widely in different areas, Mr. Briggs believes that these conditions do not vary so widely as do individual opinions on the subject.

Constructive Effort

THE paper by Mr. Curtis is an exceedingly valuable one, and the discussion to which it gave rise cleared the air quite a deal. Whatever may be said against the system adopted at Macclesfield—and it was subject to much criticism—the paper shows a spirit of enterprise which deserves full praise. It is an example of constructive effort, and constructive effort is needed to-day. It demonstrates what can be accomplished by abandoning the flat rate charge and introducing a charging system which offers inducement to all types of consumer to make greater use of gas service. The system is one of seasonal differential charges in conjunction with a step rate. The winter discount is 7½%, while in summer it is 50%—truly a remarkable discount. It was brought into operation in 1928, since when the quantity of gas sold has been increased by nearly 25% (that sold through ordinary meters by 16% and that through prepayment meters 31%), while—and this is most important—the average

consumption per prepayment meter has been increased by a matter of 22%. Now Mr. Curtis would, we think, be the last to suggest that all this has been brought about by the system *per se*. He has been helped enormously by being able to offer gas at very low rates, and we share the opinion expressed by many speakers in the discussion at the Institution meeting that a two-part tariff might well have been a better proposition, in spite of the simplicity of the discount system. The Macclesfield scheme does suffer the disadvantage that it gives full benefit to the uneconomic as well as the remunerative consumer.

Among the claims made by Mr. Curtis for his system is that no arbitrary assessment is necessary, as in two-part tariffs, and the system being applied to all consumers eliminates the possibility of invidious comparison between one class of consumer and another. An arbitrary assessment is not to our mind, however, such a stumbling block as Mr. Curtis implies. There must be a large proportion of consumers of any undertaking who feel it wholly unjust that, having increased their demand for gas far beyond that af their neighbours, they should be charged at the same flat rate. What we do not like, however—and this was referred to by Mr. Blundell in the discussion—is the method of basing the standing charge on the rateable value of the house. This method does give rise to anomalies which exasperate the consumer. Assessments for rates have a nasty habit of being changed in the upward direction, and the consumer cannot see why he should submit to an increased cost for gas because he is called upon to pay more rates.

The Seasonal Load

THE plan of Mr. Curtis was to level the seasonal load by his very large summer discount. The effect of the scheme has been to increase the summer load by 28% and the winter load by 18%. The volumes of gas represented by these percentages, however, are the same, so that he has actually added an all-the-year load to his plant. At the meeting it was suggested that with a summer load of 40% of the total, as exists at Macclesfield, it was difficult to justify such a big concession in price during the summer months, and that the vast difference between the winter bills and the summer bills could hardly help gas in competition with oil and electricity during the winter months. It was also suggested that too much can be made of the difference which exists between the summer and winter loads of any undertaking. Mr. Briggs, for instance, saying that the seasonal variation of load is not the entirely unmixed evil which the paper by Mr. Curtis might imply, explained that as far as Dudley is concerned the seasonal variation is only just sufficient to enable overhauls of plant to take place. He doubts whether any less plant in total could be employed if the yearly load followed an absolutely horizontal line graph. On the other hand, the time of repair could be more conveniently chosen. The aim should be a flattened hourly load curve rather than a flattened monthly load curve.

In any consideration of gas charges the psychological aspect must not be forgotten. Systems should be formulated which, by their appeal to the consumer, are of help to the salesman, and we do suggest that some form of multiple tariffs is of greater assistance in selling gas than a discount system which affects all consumers alike. In saying this we are in no way belittling the extraordinarily good work which Mr. Curtis has accomplished at Macclesfield. It may be remarked that his annual increase since he put his discount system into operation is no greater than it was before 1928. That is no argument. The point is that he has maintained a high rate of increase in spite of greater competition; and we have no doubt at all that if he had worked without inducement to the consumer he would have been unable to put before the Institution and the Gas Industry such a fine record of achievement. He has definitely made Macclesfield "gas-minded." That in itself is good work which will yield a handsome return in the future. All too many undertakings have no scheme of charging other than the flat rate; all too many such undertakings can show no increases. As we have said, Mr. Curtis has been able to wield that most effective competitive weapon—cheap gas. But this in no way detracts from the value of his example of courage and enterprise. His paper added greatly to the worth of the Institution meeting and to the Industry in general in once more focussing attention on what is unquestionably a problem vital to its progress.

The Rolling Snowball

A PLEA was put in by Mr. Bloor for a co-ordinated policy in regard to gas prices throughout the country, and he asked at the meeting precisely what load which we have not now got do we hope to secure by the adoption of two-part tariffs. He is of opinion that unless we gain for gas the continuous heating load we shall not benefit by introducing two-part tariffs. We disagree with this view, for we think that two-part tariffs are the best means of increasing gas usage generally, and perhaps more particularly for water heating—a load well worth all efforts to secure, and the gaining of which, by the way, demands much better technical salesmanship than is available in the Industry to-day. We see Mr. Bloor's point, however, and there is evidence that with a two-part tariff and a commodity charge in the neighbourhood of the equivalent price of solid fuel, the field open to gas is enormous. Mr. Haynes, of Rotherham, is lucky in being able to sell coke oven gas at an extremely low rate; but, here again, he would not have progressed so rapidly without a two-part tariff. As we have recorded in the "JOURNAL," about two years ago the Rotherham Gas Committee gave a trial to a two-part tariff consisting of a service charge ranging from 10d. to 2s. a week according to the type of house and a commodity charge of 10d. per 1,000 c.ft. to ordinary consumers and 1s. to prepayment consumers. The experiment proved an unqualified success. Popularity of the tariff among the consumers has been accompanied by increased revenue to the Department. It must be borne in mind, of course, that the experiment was conducted with only 134 consumers who were doubtless enthusiastic. But in the few months since the tariff was made available to all consumers the number of adherents has grown to 253 prepayment and 140 ordinary consumers. Of these, 152 previously used less than 17,000 c.ft. per annum—the town's average domestic consumption. Their new average is estimated at 45,000 c.ft. And we think that the experience of these two-part tariff consumers will lead others to adopt this very sensible system. The growth in the number will be closely watched by the Industry.

The Gas Development Scheme

THE Industrial and Commercial Gas Development Scheme has now been in operation for a year, and in the "JOURNAL" to-day we are able to give some idea of the excellent work already accomplished and of how the scheme is organized. At the inception of the scheme, we wrote in the "JOURNAL" for March 1, 1933: "We regard the new scheme of co-ordinated Gas Development Centres, with a Central Information Bureau, as one of the best advised moves ever made by our Industry; and though primarily for the development of our industrial and commercial business it will, we hope, spread its wings to cover the domestic load as well. Hats off to the enterprise and coats off to its fulfilment." And in the same issue we expressed the hope that there would be no "spongers"—undertakings willing to accept the fruits of other undertakings' expenditure while unwilling to add a dime to the cost of the organization that yields those fruits.

The fact has to be faced, however, that several undertakings—some of them comparatively large—remain outside the scheme for one reason or another. It is most important from the point of view of the whole Industry that these undertakings should join in the national effort to increase the industrial load. Many of them maintain they have no industrial or commercial load, but it is a significant fact that most of the industrial and commercial

technical inquiries which still come direct to the national bodies come from these very undertakings. We feel sure that the undertakings who are not supporting the scheme are doing a great disservice to the Gas Industry, besides stemming their own progress by pursuing an unsound policy. It has to be borne in mind that each undertaking has a duty to the Industry as a whole. People judge the Industry by their experience of the particular undertaking supplying the area in which they either reside or carry on their business. Manufacturers assess the virtues of gas by the service offered by the undertaking whose mains could deliver gaseous fuel to their industries and works. An unenterprising undertaking does in fact incalculable harm to the Gas Industry. With the Development Scheme no undertaking can offer the excuse that it has not the facilities to deal with industrial and commercial inquiries, and is unable to afford the service which the industrialist to-day expects—and can obtain from our competitors.

It will be remembered that the Centres were formed to serve two distinct purposes: To supplement the work of the existing national bodies in stimulating technical co-operation in industrial matters between various branches of the Industry; and to give practical assistance with industrial problems to all undertakings subscribing to the scheme. A good example of the type of work done is given in the article on later pages, which sets out the Constitution of a Centre and how exactly the subscribing undertaking can receive help. Particularly important in the organization of the scheme is the Central Information Bureau which has been set up at Grosvenor Gardens under the ægis of the British Commercial Gas Association, which will act as a clearing house for all correspondence between the Centres, as well as an intelligence department. The value of this Bureau, which is an essential part of the scheme as a whole, will depend, of course, on the information supplied by each individual undertaking; and we look to every undertaking to enter whole-heartedly into this pooling of knowledge. It will not be through lack of organization if the Gas Industry fails to develop its industrial and commercial business. The means are there; let us use them to the full.

Controlled Cracking

EARLY this year ("JOURNAL" for Jan. 24, 1934) we published an article by Mr. E. B. Tomlinson, Engineer-in-Chief to the Birmingham Gas Department, on the subject of controlled cracking in continuous vertical retorts. The account was one of much importance. It was found at Birmingham that a coal which, on a throughput of 6·1 tons per day, yielded 81·6 therms of 477 B.Th.U. gas under normal conditions (12·3% steaming), yielded 84·8 therms of 528 B.Th.U. gas under conditions of controlled cracking (14·5% steaming), the throughput being 5·2 tons a day. Calculating on a basis of 475 B.Th.U. gas in each case (by the addition of blue water gas of 300 B.Th.U. per c.ft.) the therms per ton are 82·3 and 99·4 respectively. These results clearly indicated the possibility of improving the yield of straight coal gas on continuous vertical retorts. Under controlled cracking conditions the coke made had a greater bulk density than that produced in normal practice, and the tar was modified, showing many characteristics of horizontal retort tar.

The foregoing investigation was carried out on Woodall-Duckham retorts fitted with special feed. In our issue to-day Mr. A. H. Burton gives an account of work undertaken at the Warrington Gas-Works, also in connection with a Woodall-Duckham installation, and on lines somewhat similar to that at Birmingham. The aim at Warrington was so to change the carbonizing conditions as more nearly to approach those obtaining in machine charged horizontals, in order to produce a tar more like horizontal retort tar. The experiments were commenced as early as 1930, and the results were most promising. In that year it was established that an improved tar and an increased thermal yield could be obtained from vertical retorts having trunk feeds. Analyses of the tars produced from retorts with and without these feeds are given in Mr. Burton's article and are self-explanatory. At present 30% of the retorts comprising the installation at Warrington are operating with trunk feeds, local conditions, in that the tar main has a length of 200 yards and but little fall, limiting the adoption of the feeds to that extent. Tests showed that the calorific value (calculated) of the gas from retorts with trunks was 508 B.Th.U., and of that from retorts without such feed 474 B.Th.U. It would have been useful if Mr. Burton had given some information on the extent of steaming in each case; but his article, like that by Mr. Tomlinson, demonstrates the importance of controlled cracking and will prove of great interest to our readers.

PERSONAL

Mr. HUMPHREY P. GAMON has been elected a Director of the Chester United Gas Company, to fill the vacancy caused by the death of Mr. John Percival Gamon.

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On June 25 Mr. FRANCIS BARBER, Chairman of the Harrogate Gas Company, and his wife celebrated their Golden Wedding, in commemoration of which Mr. C. Bateman (Engineer and General Manager of the Company) presented them with a suitably inscribed salver, subscribed for by Directors, staff, and workmen of the Company. Mr. Barber was first associated with the Harrogate Gas Company as legal adviser in 1889, and acted in that capacity until 1898 when he was invited to join the Board, and was, in 1907, appointed Chairman. He has, therefore, been a Director for 36 years, Chairman for 27 years, and intimately associated with the Company for 45 years. Mr. Barber is a keen fighter for gas, and only as recently as May 31 presided over a B.C.G.A. District Conference in Harrogate, when he gave a very able opening address.

OBITUARY

The death took place at the end of last week of Mr. ALEXANDER HARDIE, J.P., at Linlithgow, West Lothian. Deceased, who was 77 years of age, was Chairman of Linlithgow Gas Company and served on the Town Council there. For a long period he was engaged in business as a leather manufacturer, and only last year retired from the position of Session Clerk of Craigmailen Church, after discharging this office for a quarter of a century.

Forthcoming Engagements.

June 28.—COKE SALESMEN'S CIRCLE.—Visit to Beckton Works of the Gas Light and Coke Company. Paper on "The Investigation and Settlement of Coke Complaints."

June 29.—WAVERLEY ASSOCIATION OF GAS MANAGERS.—Annual Meeting in Edinburgh.

July 4.—SOUTHERN ASSOCIATION (EASTERN DISTRICT).—County Meeting at Folkestone.

July 7.—WESTERN JUNIOR ASSOCIATION.—Summer Meeting.

July 12.—SOCIETY OF BRITISH GAS INDUSTRIES.—Council Meeting, 2.30 p.m.

July 18.—B.C.G.A.—Executive Committee Meeting, 11.30 a.m.; General Committee Meeting, 2.30 p.m.

Sept. 6.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual Meeting in Inverness.

Sept. 20.—WALES AND MONMOUTHSHIRE ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—General Meeting at Porthcawl.

Sept. 24-26.—B.C.G.A.—Annual General Meeting and Conference at Sheffield.

Nov. 6 and 7.—I.G.E.—Autumn Research Meeting.

1934 "JOURNAL" Directory.

Page 74. WESTON-SUPER-MARE. Name changed to Weston-super-Mare and District Gas Company.

THE NEWS OF THE WEEK

A Seven Years' Contract for the public lighting of Wellingborough on the tender of the local Gas Company has been accepted by the Urban District Council.

Change of Address.—On and after June 25, the offices of the National Smoke Abatement Society will be transferred to 36, King Street, Manchester, 2. Callers will find the new offices almost directly opposite the present premises.

An Application to Borrow £16,000 for the erection of new continuous vertical retorts at the local gas-works was the subject of a Ministry of Health Inquiry at Ilkley on June 21 by Mr. H. W. Coates. The Clerk to the Council (Mr. H. G. Peters) said the undertaking was financially in an enviable position, and if the new scheme were approved they would be in an equally enviable position technically. There was no opposition.

The Leamington Priors Gas Company have been successful in installing gas for both heating and water heating in new public lavatories at Leamington Spa. For water heating there is a 40-gallon "Sunhot" boiler, thermostatically controlled, of the calorifier type. The heating system consists of a "Hurro Pennant" No. 60 circulator by the Hurry Water Heater Company, which supplies two "Ideal" wall radiators and one ten-column "Hospital" radiator.

Gas for Traffic Bollards.—At a meeting of the Wandsworth Borough Council last week, various proposals of the Highways Committee with regard to substituting guard posts on street refuges by illuminated bollards at three busy traffic points in Wandsworth were adopted. In this connection it is interesting to learn that while electricity will be used for the lighting of some of the bollards, those on two refuges at the junction of Huguenot Place and West Side are to be illuminated by gas.

Amalgamation of the Gas and Electricity Departments was considered last week by a Special Joint Committee appointed by the Bradford Corporation to make inquiries as to views and experience in other towns. No official announcement has been made, but it is understood a large majority of the replies—a member of the Committee put the figure as high as 95%—were unfavourable to amalgamation. The meeting was further adjourned to afford opportunity to the members of the Committee to think over the replies to hand and to receive any further replies that may be forthcoming.

The Recent Offer by Messrs. Dawnay, Day, & Co. to purchase the ordinary share capital of the Tamworth Gas Light and Coke Company has been accepted by a substantial majority of shareholders.

Street Lighting in Oldham.—The annual report for the year ended March 31 last of the Oldham Street Lighting Superintendent states that the Department is responsible for the lighting of 118 miles of public thoroughfares in the Borough. For the year ended December, 1933, the consumption of gas amounted to 52,985,000 c.ft. and electricity to 718,782 units. The gas installations comprise 71 1,500-c.p. high-pressure lamps, 440 high-power low-pressure lamps, and 3,563 low-pressure burners in ordinary lanterns. The report remarks that automatic controllers are still being used as a means of economizing gas after midnight, the saving during the year from this source being 18½ million c.ft.

Institution of Heating and Ventilating Engineers.

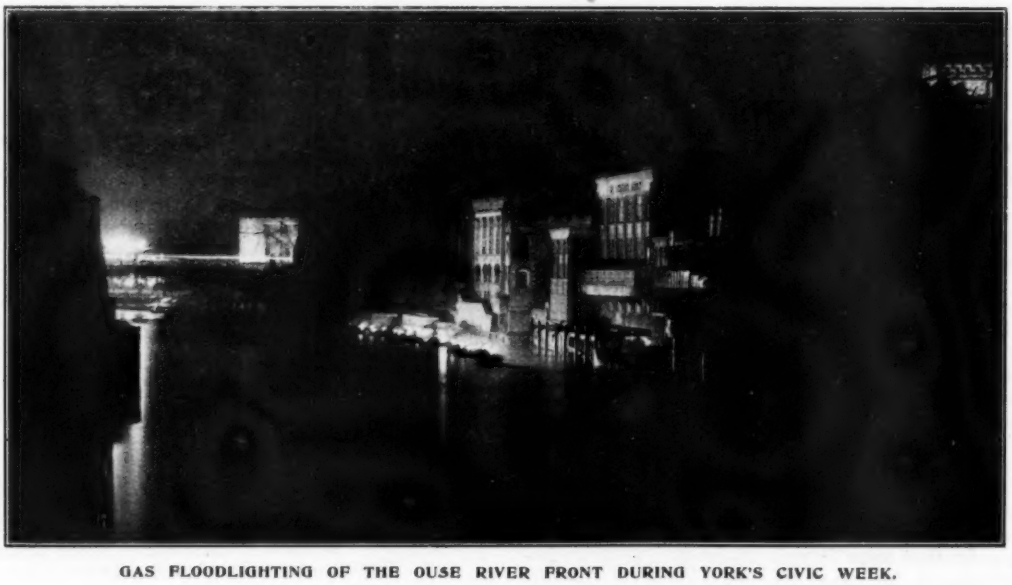
The Summer Meeting of the Institution of Heating and Ventilating Engineers was held at the Queen's Hotel, Hastings from June 18 to 20.

The first day was occupied with a meeting of the Council, and an informal reception in the lounge of the hotel, the programme proper opening on the following morning, when the Mayor, Councillor Henry Burden, J.P., addressed a few words of welcome.

After some formal business, during which the election of twenty-five new members was announced, the President, Mr. R. Comyn Ching, called for the reports of the various committees. The first had reference to the establishment of a scholarship by the Institution to be awarded every year to the most meritorious student in the evening class departments of technical institutes. It would be tenable for three years.

Called upon for the report of the Education Committee, Mr. Walter Yates, the Chairman, emphasized the importance of the inauguration of local branches. There was an idea that members in the provinces did not enjoy the same advantages as members in London. By the formation of local branches in various parts of the country this reproach would be removed.

The report of the Benevolent Committee followed, presented by Mr. W. W. Nobbs, Past-President. He stated that the Council had passed a resolution that a benevolent



GAS FLOODLIGHTING OF THE OUSE RIVER FRONT DURING YORK'S CIVIC WEEK.

This fascinating photograph shows the Guildhall and Lendal Tower.

THE NEWS—continued.

fund be established. It would be incorporated under a memorandum and articles of association specified by the Board of Trade Government Department. It appears that both the scholarship proposal and the benevolent fund establishment emanate from Mr. Ching, who was warmly thanked for the time and thought he had given to bring both projects to a successful issue.

Mr. Nobbs also reported on the research work which is being organized and carried out under the auspices of the Institution. A conference had recently been held between representatives of the Department of Scientific and Industrial Research and those of the Institution, when consideration had been given to the details regarding the building of houses in which experiments could be carried out to solve some of the questions involved in heating and ventilation.

A paper, well illustrated by a most interesting set of lantern slides was then given by Mr. A. F. Dufton, M.A., D.I.C., on "Some Heating and Ventilating Problems."

The Golf Competition for the "Haden" cup took place on the St. Leonards Golf Course, the winner being Mr. L. J. Foster. In the evening a reception was held at the Queen's Hotel, followed by a dinner and dance.

The Bar Walls, Old Mortuary, and Lendal Tower.

GAS PLAYS BIG PART IN YORK'S CIVIC WEEK

THE BEAUTY OF GAS FLOODLIGHTING

From Mr. H. E. Bloor, Engineer, Manager, and Secretary to the York Gas Company, we have received the accompanying photographs of some of the beautiful old buildings in York which the Company floodlighted by gas in connection with the City's Civic Week. The installation was unusual and the strikingly successful results proved of great popular appeal—as, indeed, will be readily understood from the illustrations. The floodlighting of the Ouse River Front—the Guildhall and Lendal Tower—shown in the photograph on the opposite page was of singular interest. Eleven boats were anchored in the river, gas being supplied to the Foster & Pullen strip lanterns from cylinders filled at a pressure of 80 atmospheres. The photograph below is of the fleet of boats containing the gas lamps and cylinders ready for the floodlighting of the Guildhall.

Bootham Bar and Part of Old Abbey Walls.

FLEET OF BOATS CONTAINING GAS FLOODLIGHT PROJECTORS AND CYLINDERS OF COMPRESSED GAS.

THE NEWS—*continued.*

North of England Association.

Visit to Stockton.

About 50 members of the North of England Gas Managers' Association visited Stockton on June 22 and inspected the Corporation Gas-Works (which have just been modernized at a cost of £24,000) and also the pipe works of the South Durham Steel and Iron Company, Ltd., where large mains are made.

The Mayor of Stockton (Alderman C. W. Allison) at a luncheon officially welcomed the members, and he was supported by Mr. R. H. Duxbury (President of the Association and Manager at South Bank) and Mr. F. P. Tarratt, of Newcastle-upon-Tyne. The Mayor expressed his confidence in the future of the Gas Industry, and said that in his opinion the £200,000 which the Corporation had spent on the Gas-Works was a good capital investment. They hoped under the management of Mr. Atley considerably to expand the service. He had never seen a more congested site than that at their works, and Mr. Atley was to be congratulated upon the excellent work he had carried out there.

Mr. W. W. Atley gave figures to show how the employment of gas for cooking purposes was progressing, and remarked that the Industry was certainly not moribund.

Glasgow Gas Inquiry.

A Special Committee appointed to inquire into the purchase of coal during 1926 has considered a statement prepared by the Glasgow Gas Manager relative to the matter, along with a comparative statement of foreign coal purchases by other British undertakings during the coal stoppage of 1926.

The Committee, after consideration of the whole situation, has resolved that the quantities of foreign coal purchased by the Emergency Committee in 1926, and the prices paid therefor, were excessive and were responsible for the present high cost of gas in Glasgow. It recommends that a Special Committee, consisting of five members of the Gas Committee and five members to be nominated by the Corporation, shall make a complete inquiry into the working and administration of the Gas Department and bring forward any recommendations they may think necessary.

Another Offer by Dawnay, Day, & Co.

The shareholders of the Lichfield Gas Company have received an offer from Dawnay, Day, & Co., Ltd., to acquire the Company with the object of its forming one of a group of the gas companies to co-operate in technical, financial, and administrative affairs. The terms are regarded as favourable by the Directors, and as trustees they recommend the shareholders' acceptance of the offer.

The Lichfield Gas Company has a capital of £30,000, comprising £21,000 "A" stock and £9,000 "B" stock.

Cumberland and Westmorland Gas Managers' Association.

Mr. A. F. Young (Cockermouth) presided over a meeting of the Association held at Cockermouth Gas-Works on June 21.

Mr. J. L. Denham (Whitehaven) was elected President for the ensuing year, and Mr. C. T. Hague (Ulverston) was elected Vice-President. Mr. F. G. Bowness (Maryport) was re-elected as Hon. Secretary.

After the meeting, the members of the Association inspected the Cockermouth Gas-Works and were, afterwards, entertained at tea through the courtesy of the retiring President.

Gas Meter Testing in Manchester

Record Number Tested

In the course of his annual report for the year ended March 31 to the Lord Mayor and Magistrates of the City of Manchester, the Official Inspector of Gas Meters for the City of Manchester (Mr. A. Winterbottom) states that the number of meters tested during the year amounted to 85,826, showing an increase of 14,103 meters, as compared with the previous year. The fees charged amounted to £5,041 7s. The sum of £20 16s. has been received from the Police Department for cleaning, &c.; sale of old material realized £6, making a total of £5,068 3s. The number of meters tested and fees charged are the highest on record since the institution of the Office in 1862.

The expenditure for the same period amounted to £4,027 12s. 3½d., including £92 10s. expended on new plant, showing a credit balance of £1,040 10s. 8½d.

During the year, 3,100 meters were rejected, or 3·6%. Of the total wet meters tested—viz., 1,340—88 or 6·5% were rejected, and of 84,486 dry meters tested, 3,012 or 3·5% were rejected.

The number of prepayment meters tested during the year was 63,780, the remaining 22,046 being meters of the ordinary type.

Mr. H. N. Barrow (Chairman of the Justices' Gas Meter Testing Committee) visited the Board of Trade and submitted the following resolution for consideration in connection with any revision of the existing Sale of Gas Acts:

> "All meters which have not been verified (or re-verified) for over 15 years shall be verified within 3 years and all meters which have not been verified (or re-verified) for over 10 years shall be re-verified within 5 years of the date of Regulations to this effect, and after such period of 5 years all meters shall be re-verified within 10 years of their last verification or re-verification."

Among the tables included in the report the following are reproduced:

TABLE 1.—*Showing Cause of Error in Meters Rejected.*

	Leaking.		More than 2% Fast.	More than 3% Slow.	Passing Gas Without Registering.	Will Not Pass Gas.	Excessive Absorption of Pressure.	Defective Back Stop.	Other Faults.	Total Rejected.	%
	External.	Internal.									
New wet meters .	..	..	1	..	..	..	..	..	..	1	1·8
Old wet meters .	27	16	21	4	6	2	4	..	7	87	6·7
New dry meters .	62	323	244	243	12	12	193	41	67	1,197	2·1
Old dry meters .	139	323	537	279	197	36	175	49	80	1,815	6·5
	228	662	803	526	215	50	372	90	154	3,100	..

TABLE 2.—*Showing Cause of Error in Meters Submitted for Certificate.*

Total Tested.	Leaking.		More than 2% Fast.	More than 3% Slow.	Passing Gas Without Registering.	Will Not Pass Gas.	Other Faults.	Total Rejected.	%
	External.	Internal.							
569	8	81	137	21	190	6	9	452	79·4

Sir Arthur Duckham Memorial Fund.

Official List of Donations from June 16 to 22.

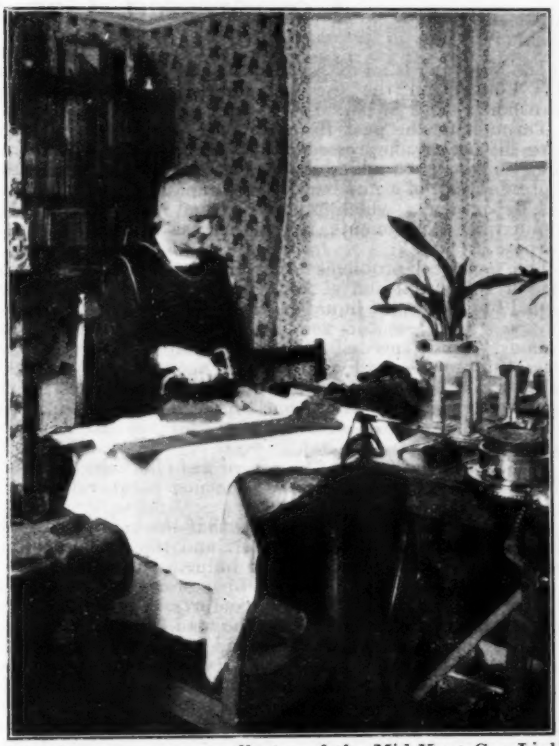
Name and Town.	Amount. £ s. d.
Maidstone Gas Company	23 0 0
Manchester District Association of Gas Engineers	21 0 0
National Gas Council of Great Britain and Ireland	25 0 0
Riddings District Gas Company, Pye Bridge	2 2 0
Woodall-Duckham Companies; Directors and Staff (Fourth Donation)	21 7 6
Donations (5) paid above	£ 92 9 6
Donations (604) paid previously	10,217 9 2
Total Donations (609) paid	£10,309 18 8
Donations (2) promised	159 0 0
Total Donations (611) paid or promised	£10,468 18 8

New Rate Schedules at Rochdale.

The Rochdale Corporation Gas Department have adopted the following system of gas charging, to come into operation from the quarter ending June 30. The prices quoted are net and apply to the area within the Borough. There are small additions for Milnrow and Whitworth and for the area outside Rochdale, Milnrow, and Whitworth.

Block system (all consumers, per quarter)—	
First 75 therms	10·0d. per therm
Next 75 ,,	8·0d. ,,
,, 100 ,,	7·0d. ,,
,, 100 ,,	6·0d. ,,
,, 150 ,,	5·0d. ,,
,, 250 ,,	4·0d. ,,
Over 750 ,,	3·5d. ,,
Two-part system (domestic consumers only)—	
£2 per annum	6·0d. ,,
Three-part system (other than domestic consumers)—	
£2 per annum *plus* £2 12s. per annum per therm of maximum daily demand	4·4d. ,,
Prepayment consumers	11·4d. ,,

A First-Rate Testimonial.

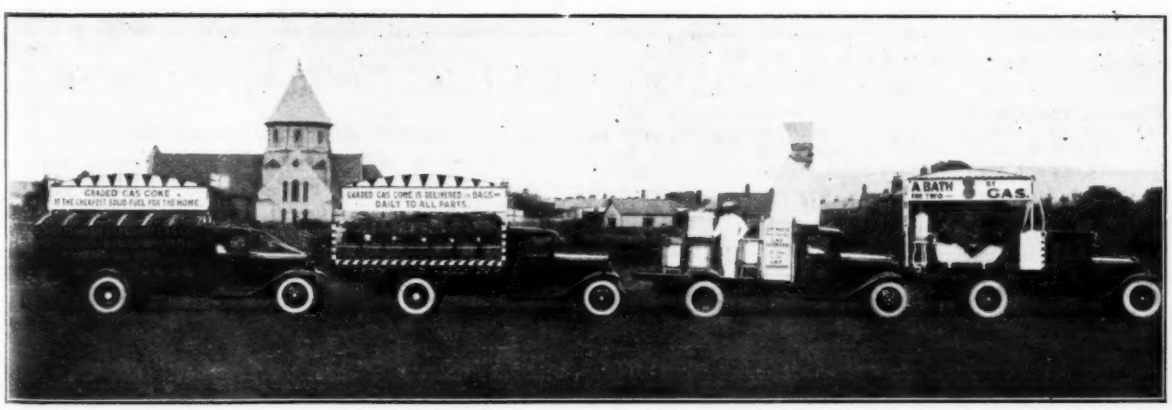


Nearly a year ago a collector of the Mid-Kent Gas Light and Coke Company recommended a gas iron to Miss Hills, of Borough Green, who, although totally blind, makes socks with a knitting machine. In our picture she is seen pressing the product of her labours with the gas iron which she lights and manipulates entirely unaided—surely a high recommendation of the safety and reliability of this appliance.

TRAVELLING PROPAGANDA

Mr. R. G. Luxon, Engineer, Manager, and Secretary, has sent us the photograph on the left showing the excellent additional use to which the Guernsey Gas Light Company, Ltd., put their district delivery vans.

The lower picture shows the "fleet" which represented the Cheltenham and District Company in a recent Hospitals' Centenary Carnival. The evergreen "Bath for Two ——" display, which has indeed been a winner up and down the country, was again successful in obtaining a first prize in the awards.



Compressed Gas for Motor Transport

The following is an extract from a report by the National Gas Council on the use of compressed gas for motor transport:

Throughout the past 18 months the problems associated with the use of compressed gas for the propulsion of motor vehicles have been under continuous review by a Committee representative of a number of gas companies and municipal gas departments which previously had been individually conducting experiments upon the use of gas for this purpose.

The technical problems involved in the substitution of gas for the propulsion of motor vehicles as at present designed for the use of liquid fuel have been solved. During the past year, motor vehicles have been running continuously and successfully upon compressed gas. No alteration to the engine has been necessary beyond the substitution of a gas and air mixing valve for the usual carburetter, and no alteration to the chassis beyond the substitution of alloy steel cylinders for the usual petrol tank.

It has been found that 250 c.ft. of gas of a calorific value of 500 B.Th.U. per c.ft. (*i.e.*, 1¼ therms) is equivalent to a gallon of motor spirit.

It was evident at an early stage that the capital costs of the compressing and storage plant and the vehicle equipment would have a considerable influence upon the practicability of substituting coal gas for motor spirit. In other words, the relative cost of using compressed gas and motor spirit is largely dependent upon the load factor of the compressing plant on the one hand, and of the vehicle storage cylinders on the other hand.

The Committee therefore devoted attention to the various circumstances in which compressing plant and fleets of vehicles might be employed with a view to determining the effect upon over-all cost of changes in operating conditions.

It will be realized that vehicle operation has important effects on compression costs since, other things being equal, the more regularly the operation of filling can be spread over the day, the more the storage capacity can be reduced.

Every hour of compressor operation during which no vehicles are filling at the station represents an additional cost per equivalent gallon of about ½d.

If the vehicle schedule allows of each vehicle filling twice daily at the compressor station, the savings in plant and vehicle equipment compared with single charging daily correspond to about 3d. per equivalent gallon.

It is impracticable to set out any statement which will show at a glance how the cost of compression and the cost of vehicle operation vary respectively with every alteration of the various factors, but if those factors are known, a close approximation can be reached in any particular case of compressing and operating costs on the basis of the present market price of compressors and cylinders.

The Committee have examined a number of possible circumstances in which the compressing plant and the vehicles might be employed, and Table I. shows the cost of using compressed gas in these circumstances in terms of the cost of an equivalent gallon of motor spirit.

A. With gas at 2d., 3d., and 5d. per therm the cost of gas compressed per equivalent gallon would be:

TABLE II.

Price of Gas per Therm.	Case I.	Case II.	Case III.	Case IV.	Case V.	Case VI.
2d.	11·2	12·5	13·5	12·0	8·2	6·6
3d.	12·5	13·8	14·8	13·3	9·5	7·9
4d.*	13·8	15·1	16·1	14·6	10·8	9·2
5d.	15·1	16·4	17·4	15·9	12·1	10·5

* As in Table I.

B. The scale of operations has only a very small effect upon costs if the daily output from the compressor station exceeds about 500 equivalent gallons per day. Below that output, however, the cost per equivalent gallon begins to rise owing to the increasing effect of labour charges, and a station planned to a daily output of 100 gallons would cost about 2d. per equivalent gallon more than a station producing 500 equivalent gallons daily.

C. No account has been taken in the foregoing estimates of the effect of any differences between the licence duties on gas-propelled vehicles and ordinary petrol vehicles.

D. The capital costs in the Tables are based on the present existing prices of "equipment," and a reduction may be expected if a sufficient demand is created.

TABLE I.—*Cost of Using Compressed Gas in Typical Cases.*

EXPLANATION OF SYMBOLS:—

1. Constant Costs in cases taken.
   - A = Cost of installing compressor at £25 per KW.
   - C = Cost of installing storage cylinders and fittings at £12 per c.ft. of water capacity.
   - K = Cost of vehicle cylinders and fittings at £12 per c.ft. of water capacity.
   - H = Number of hours per day during which compressor is in operation (taken at 10).
   - L = Average cost of labour operating compressors (taken at 2s. per hour per man).
   - X = Cost of gas in pence per therm (taken at 4·0).
2. Variable Costs in cases taken.
   - Y = Cost of electricity in pence per KW.-H.
   - G = Number of equivalent gallons of motor spirit used daily.
   - D = Number of days per week during which compressor is in operation.
   - S = Standby time in hours (*i.e.*, number of hours of compressor operation during which no vehicles are filling).
   - N = Number of chargings per vehicle per day.

Cost per Equivalent Gallon in Pence.								Size.			Capital Cost.			
Gas. 1·3X	Power. 2·33Y	Labour. L·H / G	Compressor. 2·44A / HD	Storage. 1·46C (S + 1) / HD	Total, Excluding Vehicle.	Vehicle. 1·8K / ND	Total.	Compressor KW. 2·95G / H	Storage.* 1·25G (S + 1) / H	Vehicle.* 1·07G / N	Compressor. £25 × Size in KW. £	Storage. £23·5 × Size.* £	Vehicle. £18·8 × Size.* £	Total. £
Case 1. G = 400 D = 5½ S = 4 N = 1 Y = 0·6														
5·22	1·4	0·6	1·11	1·59	9·9	3·92	13·8	118	250	427	2,950	5,870	8,020	16,840
Case 2. Case 1, but S = 8														
5·22	1·4	0·6	1·11	2·87	11·2	3·92	15·1	118	450	427	2,950	10,550	8,020	21,520
Case 3. Case 1, but Y = 1·0 and S = 8														
5·22	2·33	0·6	1·11	2·87	12·1	3·92	16·1	118	450	427	2,950	10,550	8,020	21,520
Case 4. Case 1, but G = 2,000 and S = 8														
5·22	1·4	0·12	1·11	2·87	10·7	3·92	14·6	590	2,250	2,130	14,750	52,900	40,000	107,650
Case 5. G = 230 D = 7 S = 2 N = 2 Y = 0·6														
5·22	1·4	1·04	0·88	0·75	9·2	1·57	10·8	68	87	123	1,700	2,040	2,310	6,050
Case 6. G = 1,200 D = 7 S = 0 N = 2½ Y = 0·6														
5·22	1·4	0·2	0·88	0·24	8·0	1·23	9·2	354	150	513	8,850	4,790	9,650	23,290

* In terms of the equivalent number of gallons of motor spirit

Visitors' Day at the Fuel Research Station

A great deal of work is carried out at the Fuel Research Station, East Greenwich, which is described from time to time in official publications; but in this way it may not get all the publicity to which it is so clearly entitled, and therefore we congratulate Sir Harold Hartley, F.R.S., Chairman of the Board, and Dr. F. S. Sinnatt, M.B.E., the Director, on the inauguration of a Visitors' Day. The first of these functions (following upon the lines of those held annually at the National Physical Laboratory) took place on Monday, when a large gathering of between 200 and 300 distinguished scientists and industrialists were invited by the Chairman to inspect the work in progress at the Station. It was an innovation which will probably become a habit.

Smokeless Fuel.

Readers of the "Journal" are kept posted as occasion offers regarding what is being done at the Station, for so much of the work is of the very closest interest to them. It is therefore unnecessary to go over the whole of the ground now. The latest reference to investigations at the Station, it may be recalled, appeared in our pages within the last few weeks; a paper having been presented at the recent annual meeting of the Institution of Gas Engineers by Eng.-Capt. J. Fraser Shaw, R.N. (Ret.), Chief Engineer to the Fuel Research Station, and Dr. J. G. King, B.Sc., its Chief Chemist, on the "Production of Smokeless Fuel in Chamber Ovens at Medium Temperatures." This paper described the evolution of a firebrick retort for the production of low temperature coke, and it also dealt with the use of Woodall-Duckham chamber ovens for the production of smokeless fuel at "medium" carbonizing temperatures. This Woodall-Duckham plant (which is complete with integral producer, charging car, coke car, quenching station, and coke elevating and screening plant), though designed for normal operating temperatures, is now working at from 850° to 650° C., to produce free-burning domestic fuel from blends of coal. The great advantage of the chamber ovens for this purpose is the facility with which blends of coal can be used. More small coal can be employed with the chambers.

The first-mentioned brick retort setting is producing excellent smokeless fuel. This setting, which consists of two retorts of firebrick, has aroused considerable interest, and in order to explore to a further degree the question of the carbonization of coal in narrow layers, a second setting has been installed in which the retorts are of silica. One of these retorts is narrower than the firebrick retort used for the lower temperature carbonization. As already stated, the Woodall-Duckham chamber oven setting is particularly suitable for the study of blends of coal, with a view to obtaining cokes suitable for the open fire grate. It is being used for the investigation of the effect of blending coals on the qualities of the coke produced, with the ultimate object of extending the range of coals which can be used for the production of coke of all types. Many coals which alone are useless for coke making, when blended with coking coals, give excellent coke, and the problem of blending is of first importance to the country, since the quantity of good coking coal is not extremely large.

These carbonizing plants were but two out of more than 350 separate "exhibits," but they naturally created a great deal of interest. There are grates for testing the low-temperature fuel in the matter of ignitability. It was gathered that, in order to be regarded as satisfactory for domestic use, 3 c.ft. of gas for igniting the smokeless fuel must be sufficient, and the supply of gas is strictly metered, to see that this limit is not exceeded in the tests. During the visit, there were numerous demonstrations and explanations by the staff, who were assisting Dr. Sinnatt and Eng.-Capt. Shaw in pointing out features. The Station is a big place, as is only to be expected when one considers that, as far as possible, everything is carried out on a commercial scale, in order to be directly applicable to industrial conditions. The staff, too, is considerable, numbering 213, of whom 58 are scientific and technical members. Between 8,000 and 9,000 tons of coal a year are employed in the investigations.

Gas Making in Horizontal Retorts.

On the larger scale, important work, as readers are aware, has been done recently at the Station on the carbonization of coal in horizontal retorts, which are said to be in use in about 60% of the gas-works of the country, making just under 50% of the total output of gas. This means that 8 to 10 million tons of coal are being carbonized in such retorts. It has been found at the Research Station that, if the method of heating the retorts is modified by increasing the volume of gas circulating in the heating chambers, it is possible to increase the amount of coal carbonized in the setting by over 50% without increasing unduly the coke required to heat the retorts. Further, by a simple arrangement for introducing steam into the retorts, it is possible to increase the yield of gas made by from 7 to 10 therms per ton of coal carbonized. This method, which is due largely to the work of the Station, has now been tried in three large gas-works, who report similar general results to those found at the Station.

Coal Survey.

One of the exhibits in the laboratories is devoted to the complete examination of a coal seam as it is carried out in the nine laboratories situated in the principal coal areas throughout the country. The Coal Survey is an integral part of the work being carried out at the Fuel Research Station. The problems being investigated at the Station are intimately connected with the work going on in the coalfields, and suggestions for large-scale investigations come from the Survey Committees of coalowners and others in the coalfields. In the exhibit is a section of a coal seam from the roof to the floor, which is the normal manner in which the samples are taken to the Survey Laboratories. The seam is then examined and the proportions of bright and dull coal determined, and following this the seam undergoes an intimate examination which may embrace a study of any layers which differ from their neighbours. This ensures that differences in composition are recorded, and often makes it possible for portions containing constituents objectionable as regards certain industrial operations to be eliminated, either at the pithead or by adopting different methods of mining.

The chemical and physical constitution of coal and the nature of the compounds of which it consists is being investigated by several methods, including the action of solvents and the examination of oxidation products. More certain knowledge of the constitution and differences of the various species of coal is necessary as a guide to its most economic treatment in industry and as a possible starting point of fresh developments.

Investigation on the combustion and carbonization of coal in powder form are also in progress.

In the laboratories of the Station the question of the production of suspensions of coal in oil and the factors affecting their stability during storage are receiving attention. This method of using coal may be of considerable economic importance, both to the coal and shipping industries.

Oils from Tar.

Another line of work related to the carbonization of coal is concerned with the treatment of the tars. The general purpose is to produce from tar products which will find a ready market in industry. The Station is, therefore, engaged on an investigation of the properties of the tars produced from coal at different temperatures with particular reference to (1) its suitability for hydrogenation for the production of motor spirit or lubricating oil and (2) for "cracking" to produce similar products. Already it has been found that tars produced by carbonization below a certain temperature are far more amenable to hydrogenation than tars produced at higher temperatures, but it is considered that, with improvements in the technique for the hydrogenation of tar, the range of carbonization temperatures can be extended. Low-temperature tar can be hydrogenated without any pre-treatment other than the removal of the dust. With one passage through the catalyst, the product is free from pitch and tar acids, and contains up to 45% of motor spirit. By re-processing the higher boiling oils, the total yield of motor spirit reaches 98% by volume of the original tar. The spirit requires little refining, and has high anti-knock values.

A further programme upon the hydrogenation of tar and coal is concerned with the production of lubricating oil, and specimens were shown of the lubricating oil bases produced by the treatment of light spirits with condensing agents, and fractions obtained by the hydrogenation of tar and of coal.

Plants were seen in operation for the hydrogenation of tar and coal, but the work has been mainly concentrated upon the hydrogenation of tar. A plant dealing with 1 cwt. of low-temperature tar a day has been developed, and the chief difficulties encountered in working a semi-commercial plant to deal with 2 tons a day are being solved.

Pulverized Fuel.

In connection with the burning of pulverized fuel the "Grid" burner, devised and developed at the Fuel Research Station, was shown in operation on the Lancashire boiler. The principles used in the design of the burner are such as to give a short flame, and they are also favourable to the combustion of fuels which are rather more difficult to burn than those usually used in Lancashire boilers fired with powdered coal. If the experiments are successful they should enable large quantities of coal

in Scotland, Wales, and Kent, which have a high calorific value, but the small size of which renders them unsuitable for normal firing, to be used in Lancashire boilers.

The "Grid" burner is already in use in industry, and has given particularly gratifying results in connection with metallurgical furnaces, in some cases displacing oil firing. It is, however, being further developed in a modified form as the "Multijet" burner, and one of this late type was in use in a small Babcock & Wilcox water-tube boiler. The application of a vortex to the combustion of powdered coal is also being developed in what is known as the vortex combustion chamber.

Controlled Cracking in Vertical Retorts

By A. H. Burton, Warrington.

Following a report by the Woodall-Duckham Company on the quality of the tar produced in continuous vertical retorts at Warrington, an attempt was made so to change the carbonizing conditions as more nearly to approach those obtaining in machine-charged horizontals.

Obviously some method of superheating the evolved crude gas was necessary, also the fuel would need to be brought into the carbonizing zone as quickly as possible. As the coke would still be extracted at normal rates a reduced coal orifice and consequently a higher rate of coal flow from the auxiliary hoppers to the carbonizing zone was desirable.

With these objects in view a trunk was designed substantially as shown in fig. 1, and a pair of trunks were put into operation during April, 1930, in adjacent 7-ton retorts, the two offtakes discharging into one hydraulic.

The dimensions of the trunk were based on the superheating surface available in our horizontal retorts, the distance from the bottom of the main hoppers to the top mouthpiece also being a factor.

At Warrington we have no isolated full-scale test retort, and, therefore, results obtained from retorts fitted with trunks are compared with those of full-scale working over coterminating periods.

A summary of the tests on tar taken from various hydraulics during the above period confirmed earlier results, and the gas samples taken continuously over 24-hour periods and compared with tests on the corresponding day's make were encouraging, the increased C_nH_m content being a noticeable feature.

Table II.

	Retorts with Trunks.	Corresponding Day's Make.
CO_2	3·8%	2·0
O_2	0·4 ,,	0·2
C_nH_m	2·6 ,,	1·8
CO	11·4 ,,	18·2
CH_4	22·5 ,,	20·1
H_2	57·6 ,,	53·5
N_2	1·7 ,,	4·2
Calculated C.V.	507·5 B.Th.U.	474 B.Th.U.

The effect of the trunks on the working of the retorts and the class of fuel usable was somewhat remarkable.

Owing to the continued use of standard pokers (7 ft. long) the fuel below the side rodding holes was out of reach. Thus useful rodding could only be done at the centre hole—*i.e.*, through the trunk—and the ease of working did not warrant the provision of longer rods. Retorts having trunks carbonized for many weeks 100% Lancashire slack without the least trouble.

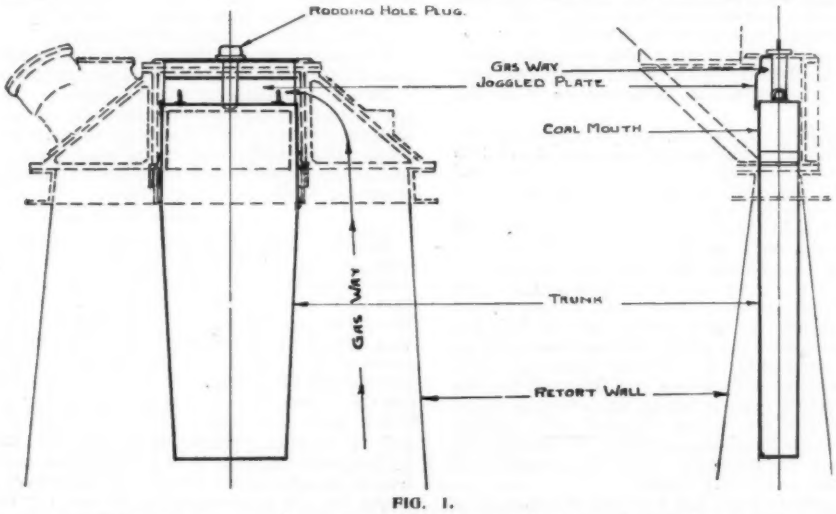


FIG. 1.

The initial experiments were definitely promising, but for several reasons could not be pursued with the continuity the subject merited. It was, however, established that a much improved tar and an increased thermal yield could be obtained from vertical retorts, having these trunks.

With reference to tar only at this period (April, 1930) a summary of tests on water free tar is as follows:

Table I.

	Distilled to—		Tar Acids.	$C_{10}H_8$.
	200° C.	200–270° C.		
Retorts with trunks (Nos. 5 and 7)	0·4%	11·5% by wt.	5·2% by vol.	Trace
Retorts without trunks (Nos. 2 and 4)	2·0 ,,	23·5 ,, ,,	11·4 ,, ,,	,,
Crude tar from wells (stock)	,,	30·8 ,, ,,	10·1 ,, ,,	,,

The viscosity of the tar from retorts 5 and 7—*i.e.*, with trunks—was 11 seconds modified Redwood.

Additional trunks were fitted until, by December, 1931, 30% of the retorts were thus equipped. The period which elapsed between the initial installation and the above date may appear somewhat lengthy, but local conditions in the shape of a tar main nearly 200 yards long and little fall forbade fitting the major portion of the retorts with trunks, for the viscosity was raised to such an extent that it was scarcely fluid at atmospheric temperatures, and consequently the tar main would have ceased to function.

The length of trunk below the top mouthpiece could have been increased, for there was no determinable increase in naphthalene in the gas, neither was there an excessive deposit of lamp black in the upper portion of the retort—that is to say, there was no over-cracking. I understand that at Birmingham there was in use at about this time a steam-driven coal feed which maintained the fuel level at approximately 8 ft. below the top mouthpiece, and that this gave the maximum useful superheating area.

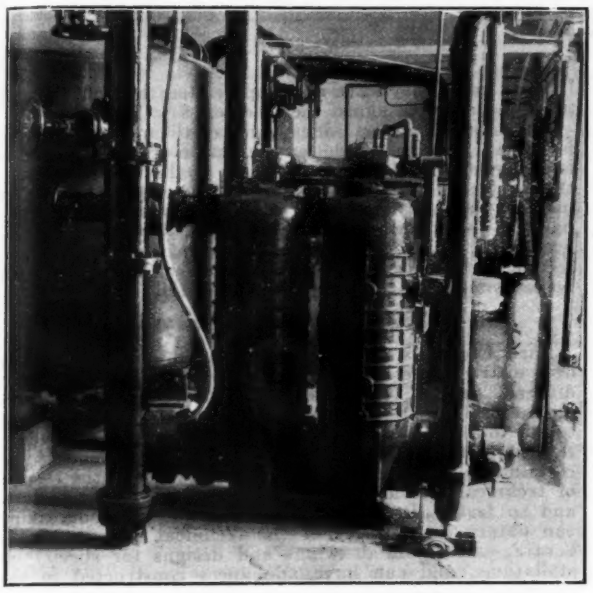
An investigation into further control of cracking by dividing the gas stream in the retort was now undertaken, the method being as follows. On reference to the diagram it will be noticed the top of the trunk is closed with a fixed lid and long plug. Thus any gas evolved within the trunk was compelled to travel downwards until it reached the lower extremity, when it came in contact with the retort walls.

Trunks with entirely open tops were made and put into use, and later the orifice was progressively decreased during which time the viscosity of the tar produced rose steadily from 3 seconds to 11 seconds by modified Redwood.

It must be understood that the class of fuel in use will have a large bearing on the extent to which the viscosity of the tar can be controlled. Large nuts, for instance, would permit a greater quantity of uncracked vapours to pass upwardly through the trunk than would slacks, and *vice versa*.

Gas Heated Open-Air Swimming Pool

By G. E. H. KEILLOR, of the Worcester New Gas Light Company.



The gas boilers can be seen in the centre of this photograph.

Swimming, indoor and outdoor, is becoming tremendously popular and is one of the most health-giving of all exercises. In the equipment of swimming ponds, modern ideas are ever demanding a higher standard of convenience, cleanliness, and comfort. Indoor ponds have generally been better equipped in the past than have outdoor, particularly as regards warming of the water. Now filtration and chemical treatment plant have been rendered necessary by the large numbers using these ponds, and, in fact, have been more or less called for by public opinion, supported by the Press.

Outdoor ponds find their season limited to the five warm months of the year, when the air temperature exceeds 50° F. Even 60° F. is too cold for many bathers and a prospect has opened up for a fuel supply to warm the water of outdoor as well as of indoor ponds. The pond owner may, therefore, lengthen his season and increase turnover by warming the water during the colder months, and if gas is to obtain its full share of such heating there is no time to lose in attacking this load, because there is great activity in construction and remodelling of swimming ponds all over the country.

In Worcester there is one of the oldest privately-owned swimming ponds in the country. It was opened in May, 1853, with flags flying, bands playing, a salute of guns!

It is believed to be the first open-air swimming pond in this country to use gas for warming the water. Messrs. Parks, who own the baths, decided during last close season to remodel the plant and bring it right up to date by installing the latest filtration, chemical treatment, and heating apparatus.

The various methods of heating were thoroughly examined and gas was chosen against all competitors. The points which brought about this decision were:

(1) Convenience and controllability.
(2) Compactness of heating units.
(3) Absolute cleanliness.
(4) Absence of labour and no fuel or ashes to handle.
(5) Suitable gas rate.

The pond in question is 90 ft. long and 45 ft. wide, containing, approximately, 120,000 gallons. The gas boiler is installed at the outlet of the treatment plant and has a rated capacity of 500,000 B.Th.U. per hour, although in practice it is exceeding this.

It is of a well-known type using a motor-driven impeller in the exhaust products stream and giving over 90% efficiency. It is supplied with gas at ordinary pressure through a 2-in. governor, and the water is circulated through it by the pump which serves the treatment plant at the rate of 14,000 gallons per hour. A thermostat is provided which also acts as a safety device should the flow of water cease. Water is drawn from the deep end of the pond, pumped through the filters, &c., and the gas boiler, and is then returned to the shallow end.

The water temperature has been maintained at 66° F. since April 30 of this year. Of course, at present (June), owing to the warm weather, the temperature is 70° F. without any aid from the gas boiler. The owners contemplate warming the water to 70° F. in future cold weather.

In the case of Worcester this is a spring and autumn load. Little or no heating is required in midsummer and the pond is closed in winter. It is quite "off-peak" and therefore commends itself for a special low rate.

The pond was formally re-opened on April 30 last upon completion of alterations, and the gas consumption up to the end of May was approximately 203,000 c.ft.

Messrs. Parks are so satisfied with the gas heating equipment that gas firing may be extended later to water heating for their slipper baths and air heating for Turkish baths.

The Industrial and Commercial Gas Development Scheme

It is well known that a number of Industrial Centres have recently been formed in various parts of the country and, as the scheme has now been operating for a year it may be of interest to review its organization and the work which has been done.

The Joint Co-ordinating Committee of the three national bodies, under the Chairmanship of Sir David Milne-Watson, was responsible for initiating the organization and appointed a Technical Sub-Committee to co-ordinate the work of the Centres already set up. The Sub-Committee consists of representatives of the following Centres: Gas Light and Coke Company, South Metropolitan Gas Company, Birmingham, Newcastle, Cardiff, Manchester (with Stretford), Yorkshire (Leeds with Sheffield), Bristol, Liverpool, and Scotland, and of the three National Bodies. It was agreed by the Committee to elect a Chairman annually, and Mr. W. Dieterichs was elected for the first year. The Secretary is Mr. J. C. Hosken. A central office and information bureau has been set up at Grosvenor Gardens.

Functions of the Centres.

It will be remembered that the Centres were originally formed to serve two distinct purposes:

(1) To supplement the work of the existing National Bodies in stimulating technical co-operation in industrial matters between various branches of the Gas Industry.
(2) To give practical assistance with industrial problems to all undertakings subscribing to the scheme.

A good example of (1) is provided by the way in which the Technical Sub-Committee dealt with the question of bread baking. Their object was to provide a factual basis on which the Joint Co-ordinating Committee could formulate a policy for the Industry as a whole. At the same time they prepared the ground for co-operation between the Industry and the oven builders and plant manufacturers. First of all the representatives of the Centres pooled their previous experience of bread baking and of dealings with oven builders and bakers. From this it was fairly clear what types of oven were most suited to gas firing and further practical tests were carried out by several Centres at the request of the Sub-Committee to determine the approximate gas consumption per sack of flour baked in each. Each Centre then sent round a questionnaire to its members to find out what gas prices they were prepared to charge bread bakers with specified loads. The average prices for each Centre, when compared with the average prices for competing fuels, gave a general idea of the competitive position of gas and what prices for gas could reasonably be expected to obtain the load for the Industry. The results obtained were then submitted to the Joint Co-ordinating Committee.

During the discussions on bread baking each member of the Sub-Committee was able to obtain a comprehensive idea of the position all over the country and was therefore able to put this knowledge at the disposal of the members of his Centre.

Another important function of the Sub-Committee is the co-ordination of the valuable work being done by some of the larger undertakings in advising manufacturers of industrial and commercial heating equipment on the best methods of applying gas to their various problems. Such work is much more important than might be imagined if gas appliances are to be kept up to the highest possible standard.

In many people's view, however, the main function of the Centres is (2), the assistance of the smaller undertakings which lack the personnel and the resources necessary in dealing with industrial problems; and the ready response which these undertakings have made to the scheme has shown that they appreciate the advantages which it has conferred. Formerly this assistance was given by several large undertakings, notably Birmingham, the Gas Light and Coke Company, the South Metropolitan Gas Company, Newcastle, and Cardiff, either directly or through the B.C.G.A. In most cases no charge was made, and it was partly due to the unfairly heavy burden thus borne by these large undertakings and the resultant dislocation of their own activities that the scheme was started. Not realizing this fact, some undertakings which had formerly received assistance free, through the B.C.G.A. or otherwise, resented being asked to subscribe to a Centre. In most cases they have now appreciated the true facts of the case and have joined the scheme.

A number of undertakings, some of them comparatively large, still remain outside for one reason or another, and it is important from the point of view of the whole Industry that these be persuaded to join in the national effort to increase the industrial load. Many of them maintain they have no industrial or commercial load, but it is a significant fact that most of the industrial and commercial technical inquiries which still come direct to the national bodies come from these very undertakings.

Constitution of the Centres.

Each Centre is responsible for the organization of its own district, and the terms of membership vary in the different Centres. In general a basic subscription is required from each contributing undertaking in proportion to its total sales of gas, with a fixed minimum, and in return for this subscription the undertaking is entitled to certain facilities such as the use of showrooms, the receipt of technical information, the training of representatives, and so forth. In addition the contributing undertaking can obtain the services of the technical experts of the Centre, can obtain drawings and designs for special installations, and can have appliances constructed in the available workshops, these services being charged for at an agreed rate. The precise arrangements under this head are decided by the individual Centres. As an illustration of the terms of the agreement between a Centre and its subscribing members it may be of interest to quote in greater detail the constitution of one actual Centre. The terms of the agreement are as follows:

The Centre agrees:

(1) To allow subscribing members full use of showrooms and demonstration rooms.
(2) To interview by appointment (at the Centre) representatives and/or consumers of the subscribing undertaking and to provide an efficient technical staff to handle problems.
(3) To assist in the training of industrial experts sent to the Centre by subscribing undertakings by arrangement.
(4) To provide information in respect of various heating processes and submit technical reports periodically to the contributing undertakings.*
(5) To prepare original designs and lay-outs for any industrial heating scheme.
(6) To provide blue prints and photographs of any work already carried out by the Centre.
(7) To visit by appointment any consumer in the subscribing undertaking's area to advise upon the merits of gas against other fuels, and prepare any necessary schemes.
(8) To make arrangements for any reputable industrial appliance manufacturers to call on a consumer in the area of the subscribing undertaking, and check specification and design of suggested equipment.
(9) To design and manufacture any special piece of apparatus which for commercial reasons cannot be supplied by an appliance manufacturer.

The subscribing undertaking, on the other hand, agrees:

(1) To compile a record of the various industries in their area and advise whether gas is being used to any extent or not.
(2) To provide an industrial representative in cases where necessary.
(3) To defray the costs incurred under paragraphs 5, 6, 7, 9—*i.e.*, in providing designs and lay-outs for specific industrial heating schemes, in supplying blue prints and photographs, in visiting consumers by appointment, and in designing and manufacturing pieces of apparatus.

Periodical Reports.

In order to keep their members in touch with what is being done, the Centres circulate to them monthly or quarterly reports. Generally each subject or process is treated on a separate sheet for ease in filing. These reports are written in the form of concise notes on recent progress in different processes, new appliances, test results,

* In practice technical bulletins are issued monthly.

&c. The following subjects were treated in a typical monthly report by one of the Centres: Air controlled gas valve, heating vats for dye boiling, conversion set for coke-fired boiler, greenhouse heating, film drying cabinet, steam for wood bending, roasting of pea nuts, emulsifier for ice cream, bottle washing plant.

Central Information Bureau.

An integral and essential part of the whole scheme is the Central Information Bureau which has been set up at Grosvenor Gardens under the ægis of the British Commercial Gas Association and which will act as a clearing house for all correspondence between the Centres, as well as an intelligence department. A comprehensive filing system has been started for information relating to industrial gas applications and a standard "installation sheet" has been developed on which descriptions of particular gas installations can be summarized in a standardized form. In addition to being filed at the Central Bureau, these installation sheets will be duplicated and distributed to all Centres, which will thus obtain the benefit of experience gained in other parts of the country.

Cross references to the installation sheets and other information such as the names and addresses of makers of various types of plant will be included in the card indexes. Each Centre will have a duplicate card index which will be kept up to date by cards sent out from the Central Information Bureau once a month. Thus each Centre will have an up-to-date index of all relevant information.

There is No Encyclopædia.

Finally let it be emphasized that there is no fountain head of all knowledge from which the Industry can draw at will. The scheme cannot produce information which is not given to it by one of the subscribing members. Its function is to make available to each the experience of all. *Vis unita fortior*—united we stand and divided we fall. No undertaking can expect help from the others unless it is prepared to do its share—however small—in pooling its resources and promoting the scheme.

Presidential Address to Gas Institute of New Zealand

By W. B. O'Toole, Engineer and Manager, Invercargill Gas Department.

[Extract.]

From the home journals and from other sources, we learn that, in spite of the economic depression, gas has continued to forge ahead overseas. A New Zealand gas engineer, who recently returned from a visit to England, writes as follows: "I am convinced that there has been great progress made since my previous visit five years ago, and that the Industry has survived the world-wide depression, perhaps better than any other similar service. Electric competition is now increasing at home, but the gas people are fully prepared for it with improvements in every direction, and I have no hesitation in stating that the future of the Industry as a whole, is assured."

As you are aware, conditions in this Dominion are as favourable as those obtaining in the Old Country. There are exceptions, it is true. Some of the less favourably circumstanced undertakings have received a check, but this is, I am sure, only temporary.

The chairman of a large northern gas company, in moving the adoption of the report and balance-sheet for the year ended December, 1933, remarked: "That notwithstanding the difficulties with which the Company had to contend due to adverse economic conditions, the result of the year's operations would be considered as satisfactory." The company, after transferring substantial funds to reserves, paid a dividend of 8% and carried forward over £14,000.

In Invercargill, owing to severe competition by other fuels, gas is somewhat at a disadvantage. However, by giving good service, and keeping as up-to-date as possible, the Department has come through with only a slight drop in the output of gas. It has, however, suffered through reduced revenue from bye-products.

Referring again to the progress of the Industry in the Dominion, the following figures covering the last twenty years must be considered satisfactory: The annual output of gas increased from 2,643 million c.ft. to 4,083 million c.ft. The number of consumers rose from 101,578 to 185,691. The number of cookers in use increased from 30,050 to 115,794, an increase of 285%.

As to electric competition for cooking, I am, unfortunately, not in possession of the latest figures, but the following, published in the *Board and Council Journal* of Sept. 16, 1931, is illuminating. "Since 1929, the number of gas cookers in use has increased from 114,634 to 132,550. By comparison, electric ranges in use increased in number for the same period from 20,254 to 29,480. In the year 1929-30, for every 100 electric ranges installed, there were 168 gas ranges. The year 1930-31 showed a still greater comparative gain for gas ranges, the proportionate increase being 237 gas to 100 electric ranges."

Gas is holding its own and will do so, so long as the service is maintained at its present high standard. In this connection, the Industry owes an immense debt of gratitude to those responsible for scientific research in connection with the application of gas in its 1,001 uses for industrial and domestic purposes.

Stove manufacturers have taken full advantage of the work of our laboratories and technicians, with the result that great strides have been made in the design, construction, and finish of gas appliances for all purposes. This obtains more particularly, perhaps, in the case of appliances for the home. For attractiveness of appearance, utility, and efficiency, gas apparatus of to-day more than holds its own with that of our competitors.

Any reference to the advancement of the Industry would, I think, be incomplete without a word of appreciation of the invaluable aid of the Technical Journals, such as the "Gas Journal," and that wonderful institution the British Commercial Gas Association.

This is a subject which has many aspects and which could be discussed at considerable length, but I will content myself with the following brief remarks. In Invercargill, we have all dry meters, mostly of the tin-plate cased type. These include 3,700 ordinary and 600 prepayment meters. During the past few years, we have been trying out the high-capacity cast-iron cased meter, and, from observations to date, I consider they will, eventually, supersede the tin cased meter. Apart from other considerations, they have two outstanding features. In the first place, the cast-iron casing is practically everlasting as against the comparatively short life of the tin-plate casing, and, in the second place, when requiring overhaul, they can be taken to pieces and re-assembled with no other tools than a screwdriver and spanner. This is in distinct contrast to the costly tinsmith's work involved in the case of the tin cased meter. My chief objection to the cast-iron meter is its weight. Perhaps, in the near future, manufacturers will discover some lighter metal which will withstand the destructive action of gas without being more expensive.

Sales.

I intend dealing with this question from a purely local aspect. We adopt the usual methods of getting new business and keeping the old. We have a showroom and office combined, situated in a central position. Advertising, apart from notices on the gas accounts, is done mostly by illustrated booklets and leaflets. Then we employ, from time to time, a qualified canvasser-salesman. A canvass of the whole city has just been completed with fairly satisfactory results. Some years ago, a hire purchase system was instituted by which appliances can be obtained by making a deposit of not less than 10% of the selling price of the appliance, and the balance can be spread over a period not exceeding ten years. This system has proved satisfactory in every respect.

Two years ago, a simple hire system was instituted. The monthly payments, which are calculated to return not less than 10% interest on the total cost of the installation, are payable with the gas account. This system, which caters for a certain class of customer, has also proved a success. We do free maintenance work to the extent of attending to lights and appliances, the only charge being for materials used. Service pipe to the value of 30s. is laid without charge, and the balance, if any, is charged at net cost.

Personally, I have never favoured the two, three, or four part charge, and have always held the opinion that each undertaking should have a system suitable to local conditions. We have a special price of 5s. per 1,000 c.ft. for storage water heaters. Large consumers for any purpose are allowed a further special deferred discount of 6d. per 1,000 c.ft. where the annual consumption is from 1 million to 1,249,000 c.ft. and 9d. per 1,000 c.ft. where the consumption is 1,250,000 c.ft. or over.

THE MARKETING OF COKE

Being a general introduction to a series of articles dealing with specialized phases of the gas coke market.

By F. M. H. Taylor, Ph.D., M.Inst.Fuel, M.I.H.V.E.

The problem of showing the largest possible returns for what is, after all, by far the most valuable bye-product of gas manufacture, has been engaging more and more attention from the larger gas undertakings during recent years.

In the carbonization of some eighteen million tons of coal per annum in gas-works throughout the country, between nine and ten million tons of coke are produced for sale, mainly for domestic uses and central heating; while it must be remembered that a further seventeen million tons of coal are carbonized in coke oven plants. Of the twelve million tons of coke so produced a quantity finds its way into the fields at one time supplied exclusively by gas coke. Low-temperature carbonization now provides a smokeless fuel, semi-coke, which is entering into competition with gas coke in one of its most valuable and rapidly extending uses, that of the open coke fire.

The various markets available for coke are tabulated below:

1. Steam raising.
2. Central heating.
3. Domestic boilers and stoves.
4. Open fires.
5. Nurseries.
6. Baking.
7. Blast and smelting furnaces.
8. Forges.
9. Filter beds.
10. Cooking braziers and cookers.

The gas manager, seeking to dispose of coke, will thus be seen to have a very wide field open to him, and many of the markets hitherto supplied by one of the many varieties of coal may be adapted for coke burning. The quantity of coal consumed for domestic purposes is forty million tons a year, and for industrial and steam raising plants—excluding railway and transport requirements—seventy million tons a year, the majority of which would be replaceable by coke if that fuel were available in sufficient quantities. There is, in addition, an ever-increasing central heating and domestic hot water load. It is obvious that the gas manager can afford to pick and choose his coke consumers, providing he is backed by a sufficiently skilful coke sales organization, and is thus able only to accept business which is of direct value and profit to the undertaking.

In choosing his consumers the following points must be considered:

(1) Nearness to works, and consequently low transport charges.
(2) The proportion of small coke, nuts, and broken coke to large.
(3) Balancing the quantity of coke sold for various months in the year with the monthly make.
(4) Fostering the most profitable class of consumer.

The most profitable class from the point of view of quantity is usually the 100 to 500 ton consumer, who would

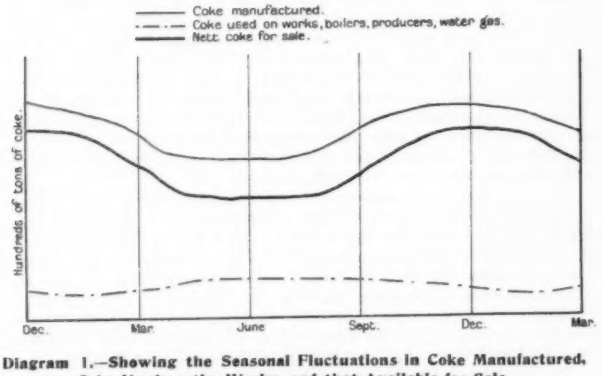


Diagram 1.—Showing the Seasonal Fluctuations in Coke Manufactured, Coke Used on the Works, and that Available for Sale.

normally take a full delivery of five tons and thus minimize delivery charges, and at the same time does not always invite competition from coals which are sold at very low prices, to the larger users.

The value of coke markets close to the works is obvious, and, although in the effort to dispose of the full make business has in the past been taken involving long deliveries, with the improved market positions now prevailing a choice appears to be possible whereby new business need only be sought nearer the works, giving more remunerative results, unless other special considerations intervene.

Owing to the fluctuations in gas consumption, with consequent closing down of a considerable proportion of carbonizing plant during the summer months, there is a corresponding reduction in the coke make. Coincident with this, however, the consumption of coke in certain markets, such as central heating, open fires, and nurseries, is completely cut off, while steam raising and baking are

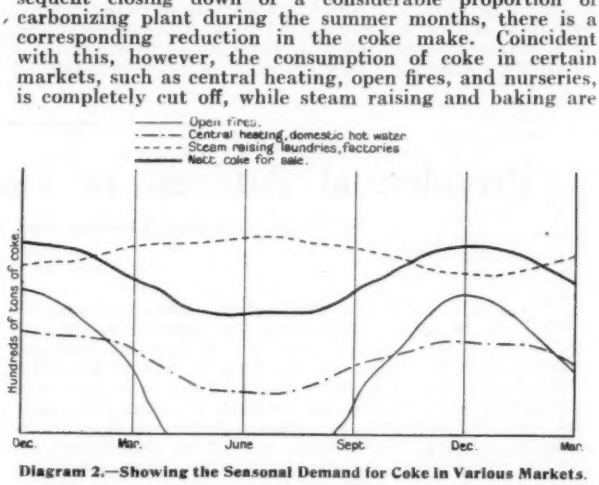
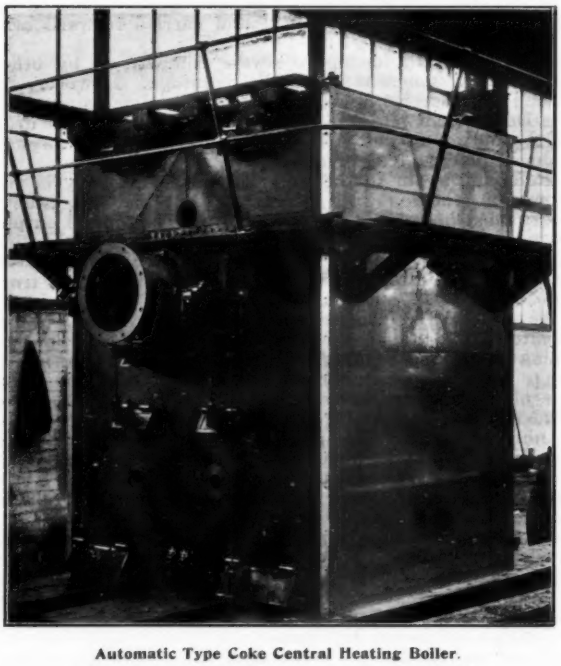


Diagram 2.—Showing the Seasonal Demand for Coke in Various Markets.

maintained at very nearly a constant output the whole year round. The sale of coke as and when it is made month by month by balancing these various classes of consumer is illustrated in the accompanying diagrams.

Diagram 1 shows the fluctuations in production, the make in the summer months being much less than in the winter. The proportion of water gas made, however, varies seasonally, and the net coke for sale is the difference between the gross make of coke and that used for water gas and works steam raising purposes.

Diagram 2 shows the seasonal fluctuations in the demand for coke for various uses. It will be noticed that domestic



Automatic Type Coke Central Heating Boiler.
[Messrs. John Thompson (Wolverhampton) Ltd.]

hot water supplies (for large buildings and steam raising for laundries and factories) provide almost constant demands summer and winter, the steam raising in certain

types of plant giving a higher load in the summer than during the winter. On the other hand, central heating, open fires, and nurseries have a fluctuating load, consumption being at its maximum for two or three months in the winter, dropping to a negligible amount in the summer, and again becoming appreciable in the autumn. Superimposed on diagram 2 is the net coke for sale figure of diagram 1.

Clearly the gas manager should choose his consumers, so as to ensure that as far as possible he retains a balance between the seasonal and the all-the-year-round loads, with the result that the monthly sales of coke should exactly equal the production. This obviates the very costly storage normally required for coke during the late summer and autumn months, provided in order to meet the peak winter demand. Re-handling of coke, with considerable losses due to breakage and degradation to breeze and smalls, means a reduction in the net price obtained.

It will be seen that in a similar manner the proportion of the various grades of coke sold can be adjusted to the make. It would therefore be necessary to cut coke only if the consumers of the smaller grades were willing to pay a sufficiently high price to cover the cost of cutting.

Methods of Promoting Sales.

In suggesting that the gas manager should pick and choose his consumers, the ways in which it is possible to make new sales or re-sales of coke to more profitable consumers may be briefly outlined.

Domestic consumers are usually covered by the house-to-house canvass for gas appliances, normally carried out by an undertaking. If possible a survey of the whole area should be made, and a list of buildings with an approximate estimate of their potential small-grade coke consumption obtained. Contacts with the local fuel merchants may lead to increased sales through their agency.

In the central heating field, building and trade papers may be scanned to obtain advice of new buildings, and the responsible people concerned may be approached with an offer of technical information, together with demonstrations of the various types of automatic controls for coke-fired plant, and if possible of automatic coke-fed boilers.

Hospitals, laundries, and works using process steam require advice on the size and type of boiler best suited to their needs, the relative merits of the various types of proprietary furnaces, and details of suitable grate bars. Information should be given as to the correct size of stack, and whether forced or natural draught should be employed. It is advisable to offer the loan of skilled stokers to enable the maximum efficiency to be obtained from steam raising plant.

If gas undertakings adopt this carefully planned sales policy, coke will achieve the distinction of selling at a higher price in proportion to its calorific value than any other solid fuel. This means that the gas manager is not only selling coke, but also selling his service and technical assistance, and is ensuring a premium for the special properties of coke. The increased price obtained will greatly exceed the extra sales cost.

BOOK REVIEWS

THE GAS FLAME AS AN AIR TESTER.*

It will be recalled that, in the course of a review of "Gas Applances and their Effect on the Composition of the Air of Rooms," by Grassberger and Luszczak ("Journal," 1933, **202**, 214), mention was made of an apparatus—the Aerokrit—devised by the authors for the investigation of the effect of the use of gas appliances on the oxygen content of the air. Early this year, the authors gave a lecture-demonstration of the use of the apparatus to the Austrian Association for Health Culture. In a new monograph, the lecture is reproduced with additional notes and specimen calculations. Full particulars of the construction and calibration of the apparatus are given. With the standard setting of the pressure of gas and primary air supplied to the burner of the Aerokrit, a range of oxygen concentrations from about 18-20% is covered, a change of 0·1 in the oxygen concentration being responsible for an alteration of $\frac{1}{25}$ in. in the height of the green cone of the flame. Successive reductions of the gas pressure enable lower oxygen concentrations to be determined, a useful range of 2% being covered at each setting. The ranges overlap each other; hence, with five standard pressures rising by increments of $\frac{1}{5}$ in. W.G. from 1 in. to 1·8 in., oxygen concentrations extending from 14·5 to 21% can be measured. From readings taken, successively, with the room air freed from moisture and freed from moisture and carbon dioxide by appropriate absorption trains, it is possible to calculate both the oxygen and the carbon dioxide content of the air by means of a formula. It is shown that carbon dioxide has a specific effect and not merely a diluting effect—*i.e.*, with a given oxygen content of the air of the room, the height of the green cone differs according as carbon dioxide is present or not.

The instrument was originally calibrated on Vienna town gas. With gas of a different quality, different settings of the gas pressure are required for the individual oxygen concentration ranges. The authors show how these pressures may be determined. While the oxygen content of polluted air may be ascertained within 0·1 of the true percentage content, the determination of the CO_2 content by means of the apparatus may entail an error which, in general, does not exceed 5% of the actual value. The magnitude of the error, with CO_2 contents ranging up to 5%, is therefore not a large one.

The authors have rendered good service in publishing this account of their apparatus, since it is likely to be of use in many directions. Though the Aerokrit is more complicated than an Orsat apparatus, the results are obtained very quickly. This is an important point in favour of the Aerokrit. An interesting application is recorded in the monograph—namely, the use of the Aerokrit for the investigation of the progressive air pollution caused in a room of 770 c.ft. capacity by the burning of 50 candles on a Christmas tree. The instrument is obviously of use in other directions, apart from the study of gas appliances. In fact, where appliances consuming other fuels are in use and no gas is available, gas in bottled form may be used for the burner of the Aerokrit.

* Die Gasflamme als Luftprüfer, by R. Grassberger and A. Luszczak. [Berlin and Vienna, 1934, Urban and Schwarzenberg. Pp. viii. + 72. Price RM. 4.50 unbound.]

IGNITION PHENOMENA IN GASEOUS MIXTURES.*

In this monograph, the author discusses the factors which are responsible for the differing combustion characteristics of the simpler gases.

The Nusselt ignition velocity equation is modified and its field of application is extended. It is shown that the ignition velocity of a mixture of combustible gas and air may be derived from the product of three factors of which one takes into account the velocity of the combustion process and a second the heat effect. The third is concerned with the effect of pressure and initial temperature.

The author gives the results of his own determinations of the ignition velocities of mixtures of combustible gases and oxygen diluted with varying proportions of nitrogen or carbon dioxide throughout the inflammability range of each gas. The gases investigated were hydrogen, carbon monoxide, and methane. In the experiments with carbon monoxide, the effect of promoters—hydrogen and/or water vapour—was studied. The results are recorded in the form of tables and graphs and are critically discussed. Additional graphs give lines of equal ignition velocity for the individual gases in admixture with varying proportions of oxygen and nitrogen or carbon dioxide in different ratios.

Differences in the combustion characteristics of hydrogen, carbon monoxide, and methane are discussed with reference to the factors concerned—namely, thermal conductivity, reaction velocity, specific heat, and ignition temperature. The question of chain reactions also receives consideration.

The book serves to throw much light on the phenomenon of gaseous combustion and should serve to stimulate further work on a subject which has attracted the attention of many investigators but has not yet reached finality.

* Der Zündvorgang in Gasgemischen, by G. Jahn. [Munich and Berlin, 1934, R. Oldenbourg. Pp. viii. + 69. Price RM. 6 unbound.]

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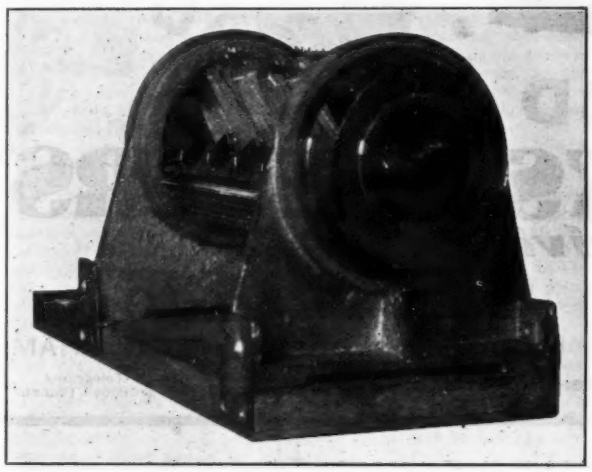
NOTES ON PLANT AND PROCESSES

New Type Rotary Screen.

An interesting departure in rotary screen design is evident in a new model recently evolved by Messrs. Fisher, Humphries, & Co., Ltd., of Atlas Works, Pershore, Worcs.

The ordinary rotary screen is divided sectionally into two or more compartments, which in the case of the new model are four in number, each composed of a screening surface and a plain plate. On the one side of the plain plate and on the radial screen plate are ribs extending from the periphery to the axis of the screen and inclined in the direction of coke travel.

The material to be graded is picked up at the screen inlet by the plain plates, and as each plate rises during rotation above the horizontal the material slides down the ribs on the plain plate to an advanced position along the screen, spreads over the radial screen, is screened over the circumferential surface as in the ordinary type, and comes to rest against the plain plate for the cycle to be repeated.



The smalls that pass through the radial mesh or holes are discharged through the slot between the mesh and plain plate. These smalls feed into the hopper at the one side of the screen, while those passing through the circumferential mesh discharge centrally and into the other side of the hopper. Thus the hopper is more evenly filled than with the usual design of rotary screen and greater effective use made of the storage space available. The positive forwarding of the coke allows the screen to be erected in a horizontal position, thus minimizing head room requirements, allowing simpler design of supporting structure, and, by avoiding end thrust, decreasing wear and maintenance of bearings, track rims, &c.

The increase of screening area in á four-compartment screen compared with the ordinary rotary screen of same diameter is stated to be roughly in the proportion of 10 to 6, but the proportionate increase is really greater due to the more effective use of the area available.

The volume of material is divided into four streams, and this with the addition of the radial screens gives more rapid separation with consequent rapid diminution of volume being handled and thus greater effectiveness.

A further point to be noted is that whereas in the ordinary rotary screen the material contact with the screening surface may be unduly prolonged with undue abrasion of surfaces and material, the positive forward travel in the new design can be arranged to give the most effective time contact. For like reasons the tonnage capacity of the new type screen can be much greater.

Corporation Undertakings' Results.

Carlisle.

The financial results for the year ended March 31, after providing for income-tax, loan repayment, &c., show a net profit of £768. The gas made was, approximately, 623 million c.ft., which exceeded last year's figures by about 19 millions. During the year gas mains have been extended at Cotehill, and new mains laid to housing states within the city. The Department have installed a total of 1,972 gas appliances of various descriptions, and, since the opening of the new showroom, increased sales are anticipated. The coal carbonized during the year amounted to 32,020 tons. The yield of coke and breeze was 19,925 tons, which is equivalent to 12·4 cwt. per ton of coal carbonized. The number of cookers out on March 31, 1934, was 13,960, as compared with 13,161 on the same day last year, being an increase of 799.

Dukinfield.

The annual report for the year ended March 31, 1934, shows that the sales of gas amounted to nearly 94 million c.ft., which represents a small decrease compared with last year. The revenue account shows that coke sales were less by about £568, but tar improved to the extent of £179 upon the figures for 1933. Total working expenses amounted to £17,740, while the revenue totalled £23,271, leaving a balance of £5,531 to be carried forward to the revenue account. The Undertaking carbonized 7,852 tons of coal, and the make of gas per ton was 13,646 c.ft. The revenue from appliance sales shows an increase over last year's figures of £157.

Stourbridge.

The sales of gas show an increase amounting to over 20 million c.ft. as compared with last year. This increase supports the impression that there is a slow improvement in trade. The gas unaccounted for is again reduced from 6·12% to 5·97%. The revenue account expenses are fairly normal, although the distribution of gas has cost somewhat more than the previous year. The income from the sale of gas has increased by about £1,400, and the revenue from residuals has also improved to the extent of about £1,000, both tar and coke having produced somewhat more. The gross profit is £21,809, an increase of £797. The balance from revenue account is subject to the usual deductions for income-tax, annual instalments, expenditure on mains, services, &c., and the surplus, after these deductions, is £3,072, an increase of £230.

Gas Acts (1920 and 1929) Orders.

SPECIAL ORDERS.

Berkhampstead Gas Company.

To extend the limits within which the Company are authorized to supply gas, to enable them to supply within the parishes of Aldbury, Little Gaddesden, Nettleden, and Wigginton in the rural district of Berkhampstead, and part of the parish of Eddlesborough in the rural district of Wing, and to make provision as to the price or prices to be charged for gas supplied therein. To empower the Company to purchase by agreement any debentures or debenture stock of the Company, and to apply their funds for the purpose, &c.

Bishop's Stortford, Harlow, and Epping Gas and Electricity Company.

The Company desire to change their name to the Bishop's Stortford, Epping, and District Gas Company, to secure further capital provisions, &c.

Workington Corporation.

Authority is sought to exclude from the Corporation's limits for the supply of gas the Parish of Lowca, to define the limits of supply, and to use scheduled lands for gas purposes.

DECLARATION OF CALORIFIC VALUE.

The Swindon United Gas Company intend to supply gas of a calorific value of 475 B.Th.U. as from Oct. 1.

Legal Intelligence

Action Against Dunfermline Town Council.

In Edinburgh Court of Session at the end of last week Lord Carmont tried three actions against the Dunfermline Town Council. The pursuers were Henry Wallace, labourer, who sued for £750; Henry Marshall, labourer, who sued for £350; and Andrew Woodrow Miller, labourer, who sued for £350. The sums were claimed as damages in respect of personal injuries sustained as the result of an accident in the burgh gas-works on Oct. 18 last.

The pursuers stated that they were engaged emptying the purifying tanks. A double hoist operated by a steam winch is used. The pursuers were being lowered in one of the cages when the steel rope broke and the cage and its load dropped heavily to the floor level, and the three men were injured. They averred that the accident was due to the fault and negligence of the defenders. They said that the plant was unsuitable, the steel rope being insufficiently strong to carry the cage with its load of men.

The defenders denied fault and pleaded contributory negligence. They averred that the pursuers were aware that the proper and ordinary method of proceeding to and from the top of the purifiers was by means of a stair provided for the purpose. The hoist was provided for the purpose of raising and lowering material only. The steel rope was suitable and of adequate strength for the purpose for which it was provided.

The jury found unanimously for the pursuer Wallace and assessed the damages at £600. The Court afterwards proceeded to hear evidence in the other two actions. The jury subsequently awarded £200 to Miller and £150 to Marshall.

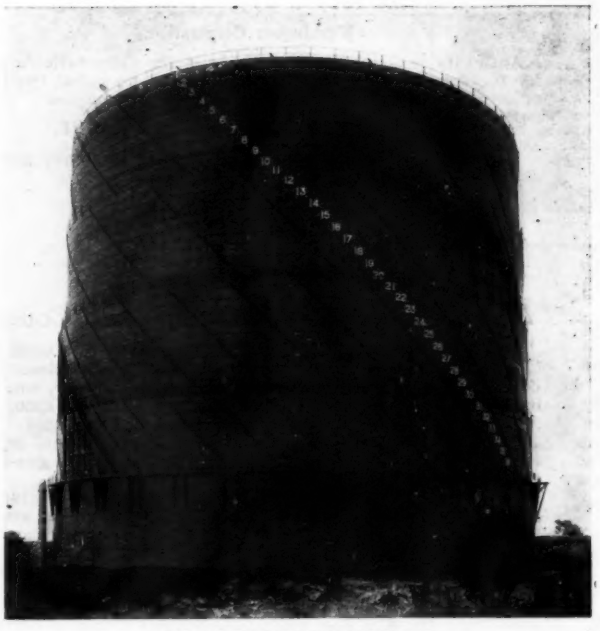
BRADDOCK'S METERS

are giving

EFFICIENT SERVICE

J. & J. BRADDOCK (Branch of Meters Ltd.), Globe Meter Works, OLDHAM.

Telephone No. 2412 Hop. | Telegrams "Metrique Lamb London" | and 45 & 47, Westminster Bridge Rd., S.E.1. | Telephone No. Main (Oldham) 3815/6 | Telegrams "Braddock, Oldham."



AT WOLVERHAMPTON
CAPACITY, 3 MILLION CUBIC FEET

C. & W. WALKER

LIMITED
DONNINGTON
Nr. WELLINGTON
—SHROPSHIRE

SPIRAL GASHOLDERS

BRITISH MATERIALS
BRITISH LABOUR
HIGHEST QUALITY
IN
WORKMANSHIP

70 YEARS
EXPERIENCE

MILBOURNE SELF-LUBRICATING ROLLER CARRIAGES

LONDON OFFICE — 70, VICTORIA STREET, WESTMINSTER, S.W.1

Whessoe Foundry and Engineering Company.

Improved Results.

The Fourteenth Annual General Meeting of the Whessoe Foundry and Engineering Company, Ltd., was held on June 19 at 25, Victoria Street, London, S.W.

Mr. HAROLD G. JUDD, C.B.E. (the Chairman of the Company), presided.

The SECRETARY (Mr. W. T. Pallin) having read the notice convening the meeting and the report of the Auditors,

The CHAIRMAN said: The Directors' report and accounts have been in your hands for some days, and, with your permission, we shall take them as read.

The year under review adds one more to the series of years which have been characterized by severe depression and the keen competition which naturally accompanies such depression. This contraction has affected our export trade in particular, and we sincerely trust that the long awaited "reorganization" of the iron and steel industry will result in lower prices of steel for export, and thus enable us to quote on more equitable terms with our foreign competitors in the export market.

In view of these difficulties, it is a matter of some satisfaction that the Company has succeeded not only in making ends meet but in producing sufficient profit to enable us to pay a reasonable dividend. This position has only been achieved as the result of the policy we have been following for some time of broadening the base of the Company's products and developing additional lines of manufacture.

NEW TYPES OF PLANT.

In these days of specialization and keen competition the introduction of new kinds of work is an expensive and often hazardous matter. It has necessitated on our part an increase in our technical and research departments and a large amount of investigation into new classes of engineering, but I am glad to say that these researches have resulted in some new types of plant which we believe will do the Company credit and assist our order book.

In particular, I may refer to the Whessoe electrical precipitation plant, which is adapted for use in connection with blast furnaces, coke ovens, and gas-works. Despite the competition of other systems earlier in the market, we have secured orders for precipitation plants of this type from companies of the highest standing, and we hope that these will be but the precursors of other orders to follow.

Among the other developments on which we have been working are coal-cleaning plants. After much investigation and experiment, we installed at the works a demonstration plant on a system for which we hold the British licence and which we believe will compare favourably with similar plants on the market. These new developments in no way affect the continuance of the older types of work for which the Company has justly a high reputation—*e.g.*, oil tanks, gas plant, blast furnace plant, chemical plant, and weighbridges.

As you know, our works were practically rebuilt a few years ago, and since then we have spared no expense to maintain them in the highest state of efficiency, with the result that we are in a position to quote for a wide range of work at economical prices. We have, however, set our face against cut-throat competition, which in many cases has resulted in the acceptance of work at prices which can only spell loss to the maker.

STRONG FINANCIAL POSITION.

While there are some indications that the industrial tide has turned for the better, only a ripple of this has reached the industries in which we are mainly concerned, but I hope that any advance of the tide may be marked by saner competition and more remunerative price levels. Meantime, our Company is fortunately in a very strong financial position and thus able to take advantage of every opportunity that offers.

The accounts themselves call for but little comment. The works and plant stand at a figure of about £25,000 less than at the inception of the Company, although they are substantially better both in capacity and efficiency than they have ever been.

The market value of the investments is, as stated in the Directors' report, well in excess of the figure at which they appear in the balance-sheet.

THE PROFIT AND DIVIDEND.

With the improvement in trading results as compared with the preceding year, and the dividends and profit on investments realized, we have been able to provide ample depreciation, and to maintain our welfare and provident schemes, and leave a profit of £7,555. Adding the amount brought forward from the preceding year, £4,135, we have sufficient to pay a dividend of 5% (less income-tax) and carry forward £3,980. Our general reserve remains intact at £35,000, and due provision has been made for all known contingencies.

I now move the adoption of the Directors' report and the accounts, and the declaration of a dividend of 5% (less income-tax at 4s. 6d. per pound) to be paid on June 29.

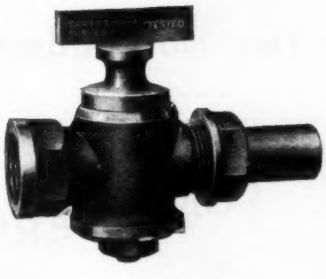
Mr. HARRY CLAYTON, A.C.A., seconded the resolution, which was carried unanimously.

SAWER & PURVES
(BRANCH OF METERS LTD.)

OUR MAIN TAPS
ARE UNSURPASSED
FOR QUALITY.

PRICES RIGHT.

May We Quote You?



No. 119.

Makers of

ORDINARY . . . .
PREPAYMENT . . .
TWO-COIN . . . .
HIGH CAPACITY .

METERS

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GRAMS: 2645 SAWER, WATFORD

RADFORD ROAD
NOTTINGHAM
PHONE: 75202
GRAMS: SAWER, NOTTINGHAM

MILES PLATTING
MANCHESTER, 10
PHONE: COLLYHURST 2289
GRAMS: SAWER MANCHESTER

THE SUTHERLAND METER Co. Ltd.

ELECTRIC AVENUE, WITTON
BIRMINGHAM, 6

TELEPHONE
EAST 1291-1292
THORNTON HEATH 1331

AND 147 ST. JAMES ROAD, CROYDON.

TELEGRAMS
METERISTIC, BIRMINGHAM.
METERISTIC, CROYDON.

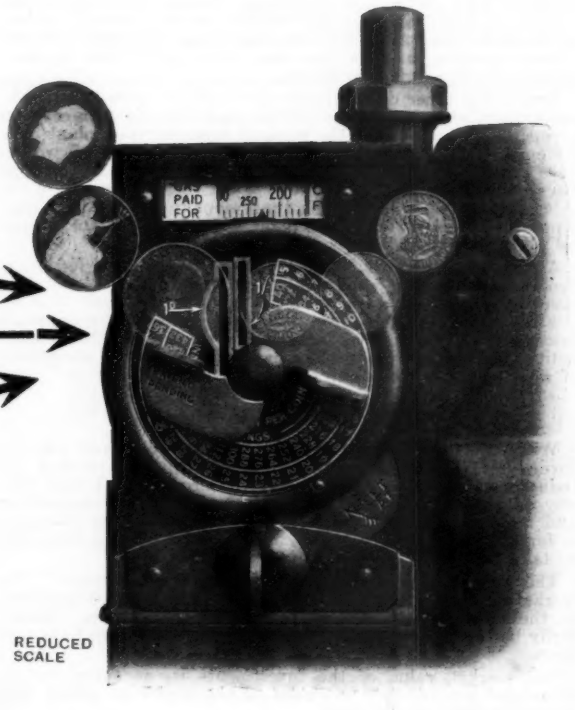
THERE'S NO DOUBT ABOUT A "RADIAL DU-SLOT"!

IT IS

COMPREHENSIVE OF EVERY DISTRICT REQUIREMENT AND IS FOOL-PROOF!

The two slots indicate TO ——

CONSUMERS →
COLLECTORS →
STORES AND FITTERS →



REDUCED SCALE

THAT IT IS A TWO-COIN METER

Consumers have for years put Pennies into One Slot
They may put Shillings into Penny Meters!

Two Slots Help Consumers

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The continued support of British Government securities was the feature on the Stock Exchange last week, for whereas at this time of the year there is usually a large amount of liquidation for half-yearly balance-sheet purposes, this movement so far has been almost negligible, thus indicating a plentiful supply of available funds. Kaffirs, after an early set-back, came into prominence again and several prices made further improvement. Other sections presented few features, though the tone generally was steady.

The volume of business in the Gas market was heavier than the previous week, and prices showed a hardening tendency. It will be seen from the Stock and Share List that several debenture stocks more than recovered the recent *ex* interest reductions, while in addition to these Tottenham 5% preference advanced 3 to 117½, and, on the local Exchange, Sheffield 4% debenture also rose 3 to 103. Bristol 5% maximum hardened 2½ to 119 (at Bristol), and Hastings 3½% (5½% dividend) gained 2 to 119½. Among the transactions some high prices were recorded though the quotations remained unchanged—*e.g.*, Lea Bridge at 174, and South Metropolitan with several at 136¼ and one parcel at 139.

At the time of writing there is a fairly representative list of ordinary stocks on offer, while in the preference list the only parcel of note is that of £15,841 Eastbourne 5% at 124, free of expenses, at which price the yield works out at £4 0s. 7d.%, the first dividend being payable in March, 1935. The list of debentures on offer is heavier than of late, and includes the following, all of which are perpetual: £1,000 Bristol 4% 1st at 105 (yielding £3 16s. 2d.%), £100 Eastbourne 5% at 125 (yielding £4%), £200 Hastings 4% and £135 Portsmouth 4% both at 103 (yielding £3 17s. 8d.%), £950 Swindon 5% at 120 (yielding £4 3s. 4d.%), and £85 Uxbridge 5% at 125 (yielding £4%).

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *June* 25.

There are no changes to report in the tar products market.

Pitch continues steady at 58s. to 60s. per ton f.o.b.

Creosote is not less than 4d. per gallon.

Refined tar is 4d. to 4¼d. per gallon in bulk at makers' works.

Pure toluole is 2s. 4d. to 2s. 5d.; pure benzole, 1s. 9d. to 1s. 10d.; 95/160 solvent naphtha, 1s. 7d. to 1s. 8d.; and 90/160 pyridine, 7s. to 7s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

June 25.

The average prices of gas-works products during the week were: Gas-works tar, 25s. to 30s.; Pitch—East Coast, 55s. to 57s. 6d. f.o.b. West Coast—Manchester Liverpool, Clyde, 55s. to 57s. 6d.* Toluole, naked, North, 1s. 11d. to 2s. Coal-tar crude naphtha, in bulk, North, 6½d. to 6¾d. Solvent naphtha, naked, North, 1s. 5½d. to 1s. 6d. Heavy naphtha, North, 10d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 3¼d. to 3½d.; low gravity, 3¼d. to 3½d.; Scotland, 3⅜d. to 3⅝d. Heavy oils, in bulk, North, 3¾d. to 4¼d. Carbolic acid, 60's, 2s. to 2s. 1½d. Naphthalene, £10 to £11. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *June* 23.

Little or no change in values is recorded during the week. New business is not plentiful, but distillers are comfortably placed on contract.

Crude gas-works tar.—The actual value is 35s. to 37s. per ton *ex* works.

Pitch.—This market is dull, and export price remains purely nominal at 45s. to 47s. 6d. per ton f.o.b. Glasgow. In the home market, 42s. 6d. to 45s. per ton *ex* works in bulk is quoted freely.

Refined tar is enjoying a large demand at present, but prices are very keen at from 3d. to 3¼d. per gallon *ex* works naked, according to quantity.

Creosote oil.—Prompt supplies are still scarce and prices are therefore firm. B.E.S.A. Specification oil is 4d. to 4¼d. per gallon; low gravity, 4¼d. to 4¾d. per gallon; and neutral oil, 4¼d. to 4½d. per gallon—all f.o.r. in bulk.

Cresylic acid.—If anything, demand is slightly better; but quotations remain unaltered. Pale, 97/99%, is 1s. 2½d. to 1s. 3½d. per gallon; dark, 97/99%, 1s. to 1s. 1d. per gallon; pale, 99/100%, 1s. 4d. to 1s. 5d. per gallon—all f.o.r. in buyers' packages.

Crude naphtha.—Available supplies command 4¾d. to 5¼d. per gallon, according to quality and quantity.

Solvent naphtha.—90/160 grade is quoted freely at 1s. 4d. to 1s. 4½d. per gallon, while 90/190 grade is accumulating with value not higher than 8d. per gallon.

Motor benzole is called 1s. 6d. per gallon *ex* works, but supplies are negligible.

Pyridines are purely nominal. 90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade 6s. 6d. to 7s. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	9	to	0	9½	per gallon at works
Motor ,,	1	3½	,,	1	4	,, ,, ,,
90% ,,	1	4	,,	1	4½	,, ,, ,,
Pure ,,	1	7½	,,	1	8	,, ,, ,,

Trade Notes.

New Premises for Meter Makers.

Messrs. George Wilson (Gas Meters), Ltd., have recently erected a new and up-to-date works in Aslett Street, Wandsworth, S.W., to cope with their increased output for the London area. They are moving over from their branch at Raynes Park this week, and will be working at full pressure in Wandsworth in two or three days.

Horseley Bridge & Thomas Piggott, Ltd.

The new General Catalogue of Messrs. Horseley Bridge & Thomas Piggott, Ltd., Tipton, Staffs., indicates the field in which they are able to assist engineers. As is already well known, the firm specialize in steelwork of many descriptions. The catalogue describes plant for producing oil from coal, roofs from standard pressed steel units, waterless gasholders, automatic gates for river control, as well as the steelwork for carbonizing plant.

Contracts Advertised To-Day.

Coal.

Keighley Gas Department. [p. 922.]

Oxide of Iron—New and Spent.

Keighley Gas Department. [p. 922.]

Pipes, &c.

Clacton Gas and Water Department. [p. 922.]

New Capital Issues.

Gosport District Gas Company.—The £10,000 consolidated ordinary stock and £5,000 5% perpetual preference stock in this Company was submitted on Thursday of last week and met with a ready sale, the whole 210 lots being sold in an hour. The consolidated ordinary stock realized from £156 to £159 per £100 and the 5% perpetual preference stock from £113 to £116 per £100. The total realized was £21,343 10s.

CO LTD

•

GLOVER - WEST

CONTINUOUS VERTICAL RETORTS

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WEST VERTICAL

SEMI-INTERMITTENT CHAMBERS

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WEST

FUEL-HANDLING & GRADING PLANT

Copies of our publications, "Results in Glover-West Vertical Retorts," "Features of the Glover-West System," "Steaming in Vertical Retorts," and "The West Lip-bucket Conveyor" will gladly be sent on request.

Designed, Manufactured, and Erected by

WEST'S GAS IMPROVEMENT COMPANY, LTD.

MILES PLATTING, MANCHESTER 10

TELEPHONE : COLLYHURST 2961 (4 LINES)

TELEGRAMS : STOKER MANCHESTER

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

Issue. £	Share.	When ex-Dividend.	Dividends. Prev. Hf.-Yr. % p.a.	Dividends. Last Hf.-Yr. % p.a.	NAME.	Quotations. June 22.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week.
1,551,868	Stk.	Apl. 9	7	7	Alliance & Dublin Ord. ...	128—136	...	133½—135½
274,000	,,	Jan. 8	4	4	Do. 4 p c. Deb. ...	90—100	...	...
557,655	,,	Mar. 5	7	7	Barnet Ord. 7 p.c. ...	167—172	...	170½—172
300,000	1	May 7	1/9⅜	1/9⅜	Bombay, Ltd.	27/6—29/6	...	...
178,480	Stk.	Feb. 19	9½	9½	Bournemouth sliding scale	203—208	...	205
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	165—170	...	...
489,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	142—147	...	...
50,000	,,	June 11	3	3	Do. 3 p.c. Deb. ...	78—83*	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108*	...	106
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	119—124*	...	...
357,200	,,	Mar. 5	7½	7½	Brighton, &c., 6 p.c. Con. ...	161—166	...	...
540,000	,,	,,	6¾	6¾	Do. 5 p.c. Con. ...	151—156	...	...
195,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	140—145	...	...
1,487,500	,,	Mar. 5	5	5	Bristol 5 p.c. max.	118—120a	+2½	...
120,420	,,	June 11	4	4	Do. 1st 4 p.c. Deb. ...	102—105 *	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb.	102—105c *	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	121—123a*	...	...
855,000	,,	Apl. 9	7	8	British Ord.	155—160	...	157—159
100,000	,,	June 11	7	7	Do. 7 p.c. Pref.	151—156*	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	104—109*	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100*	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	107—115*	...	...
160,000	,,	June 11	5	5	Cambridge 5 p.c. Deb. ...	115—120*	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1½—3½	...	...
100,000	10	Nov. 6	4½	4½	Do. 4½ p.c. Pref. ...	5—7	...	...
150,000	Stk.	Dec. 18	4½	4½	Do. 4½ p.c. Deb. ...	95—100	...	...
626,860	,,	Feb. 19	6	6	Cardiff Con. Ord.	128—133	...	132
287,860	,,	June 11	5	5	Do. 5 p.c. Red. Deb.	103—108*	...	...
157,150	,,	Feb. 19	5	6½	Chester 5 p.c. Ord.	112½—122½b	...	...
98,986	1	May 7	2/-	2/-	Colombo, Ltd. Ord.	1⅞—1⅞	...	...
24,500	1	,,	1/4⅛	1/4⅛	Do. 7 p.c. Pref. ...	18/6 - 20/6	...	...
609,204	1	Mar. 19	/11'48	/11'48	Colonial Gas Assn. Ltd. Ord.	19/6—21/6	...	...
296,053	1	,,	1/3'30	1/3'30	Do. 8 p.c. Pref.	23/6—25/6	...	...
1,775,005	Stk.	Feb. 19	5	6½	Commercial Ord.	120—125	...	120
475,000	,,	June 11	3	3	Do. 3 p.c. Deb. ...	76—81*	...	...
286,344	,,	Mar. 5	5	5	Do. 5 p.c. Deb. ...	120—125	...	123
807,560	,,	Feb. 19	7	7	Croydon sliding scale ...	154—159	...	...
569,590	,,	,,	5	5	Do. max. div.	105—110	...	109
620,385	,,	Jan. 8	5	5	Do. 5 p.c. Deb.... ...	121—126	...	...
542,270	,,	Mar. 5	7	10	Derby Con.	178—180e	...	...
55,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb.	98—100e	...	...
309,000	,,	Feb. 19	5	5	East Hull Ord. 5 p.c. ...	106—111	...	...
181,625	,,	Mar. 5	6	6	East Surrey Ord. 5 p.c. ...	126—131	...	...
175,609	,,	June 11	5	5	Do. 5 p.c. Deb. ...	116—121*	...	...
1,002,180	,,	Apl. 9	†5	†7	European, Ltd.	121—126	...	121—121½
19,342,763	,,	Feb. 19	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	26/10½ - 27/4½f	...	27/—27/3
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	87—90	...	87½—88½
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	104—107	+1	105½—106½
6,102,497	,,	May 28	3	3	Do. 3 p.c. Con. Deb. ...	84—87	...	84½—86½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—118	...	116½—117
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	113—116	...	114½
270,466	,,	Mar. 5	6	6	Harrogate New Cons. ...	125—130	...	...
82,500	,,	Mar. 5	7	7	Hastings & St. L. 5 p.c. Conv.	147—152	...	...
258,740	,,	,,	5½	5½	Do. 5½ p.c. Conv.	117—122	+2	118—120
140,000	1	Apl. 23	1/7½	1/7½	Hongkong & China, Ltd. ...	1⅛—1⅜	...	29/6—30/-
218,200	Stk.	Mar. 5	6	6	Hornsey Con. 5½ p.c. ...	128—133	...	...
5,600,000	,,	May 28	†0	†4	Imperial Continental Cap.	207—212	...	208—210
223,130	,,	Feb. 5	3½	3½	Do. 3½ p.c. Red. Deb.	89—94	...	...
235,342	,,	Mar. 5	8½	8½	Lea Bridge 5 p.c. Ord. ...	169—174	...	174
2,167,410	,,	Mar. 5	6	6	Liverpool 5 p.c. Ord. ...	182—184b	...	...
245,500	,,	June 11	5	5	Do 5 p.c. Red. Pref. ...	101—111b*	...	...
306,088	,,	Jan. 15	4	4	Do. 4 p.c. Deb. ...	101¼—103¼b	...	...
165,736	,,	Feb. 19	8	10	Maidstone 5 p.c. Cap. ...	180—190	...	...
56,176	,,	Jan. 8	3	3	Do. 3 p.c. Deb. ...	72—77	...	...
75,000	5	May 28	†10	†10	Malta & Mediterranean ... Metropolitan (of Melbourne)	...	...	...
892,000	—	Apl. 8	5½	5½	5½ p.c. Red. Deb.	98 103	...	...
231,978	Stk.	Feb. 19	5	5	M. S. Utility "C." Cons. ...	113 - 118	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	95 100	...	...
360,075	,,	June 11	4	4	Do. 4 p.c. Deb. ...	100—105*	+2	99—104½
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	118—123*	+3	119
675,000	,,	May 28	†6	‡13	Montevideo, Ltd.	60 65	...	...
2,061,315	,,	Mar. 5	5	8‡	Newcastle & Gateshead Con.	25/3 - 26/-d/	+/-/1½	...
682,886	,,	,,	4	4	Do. 4 p.c. Pref. ...	99—101d	...	...
776,706	,,	June 11	3½	3½	Do. 3½ p.c. Deb. ...	90½—91½f*	...	...
277,385	,,	May 7	5	5	Do. 5 p.c. Deb. '48 ...	106—107d	...	...
274,000	,,	Feb. 19	5	5	Newport (Mon.) 5 p.c. max.	106—108a	...	...
204,940	,,	Mar. 19	7½	7½	North Middlesex 6 p.c. Con.	155—160	...	...
336,160	,,	Feb. 5	5	5	Northampton 5 p.c. max. ...	100—105	...	...
300,000	,,	May 7	†9	†7	Oriental, Ltd.	155—160	...	...
416,517	,,	June 11	8	8	Plym'th & Stonehouse 5 p.c.	164—169*	...	...
504,416	,,	Feb. 19	8	8	Portsm'th Con. Stk. 4 p.c. Std	168—173	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	105—110	...	...
114,000	,,	Feb. 19	5	5	Preston 5 p.c. Pref. ...	108—108	...	...
686,312	,,	Jan. 22	4	4	Primitiva 4 p.c. Rd. Db. 1911	87 - 92⅝	...	...
889,813	,,	Dec. 18	4	4	Do. 4 p.c. Cons. Deb.	88—93	...	91½—92½
150,000	10	Mar. 19	6	6	San Paulo 6 p.c. Pref. ...	7—8	...	...
1,736,968	Stk.	Mar. 19	6	6	Sheffield Cons.	138—140e	...	...
95,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb.	101—105e	+3	...
133,301	,,	Feb. 19	8½	5	Shrewsbury 5 p.c. Ord. ...	135—140	...	...
90,000	10	May 28	‡4	‡3	South African	2—4	...	...
6,709,895	Stk.	Feb. 19	5	7	South Met. Ord.	132—136	...	134½—139
1,135,312	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	140—145	...	143
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf.	103—107	...	104—107
1,895,445	,,	Jan. 8	3	3	Do. 3 p.c. Deb. ...	84—87	...	86½—87
1 000,000	,,	Jan. 22	5	5	Do. 5 p.c. Red. Deb.	114—117	...	116—115½
209,820	,,	Mar. 5	8½	8½	South Shields Con.	166—168d	...	...
1,543,795	,,	Feb. 19	6	6	South Suburban Ord. 5 p.c.	130—133	...	131
512,825	,,	,,	5	5	Do. 5 p.c. Pref.	118—123	...	121—122½
300,000	,,	,,	—	4	Do. 4 p.c. Pref.	103—108	...	...
868,887	,,	June 11	5	5	Do. 5 p.c. Deb.	119—124*	...	121½—122
100,000	,,	,,	4	4	Do. 4 p.c. Deb.	103—107*	...	...
647,740	,,	Mar. 5	5	5	Southampt'n Ord. 5 p.c. max.	110—115	+1	113½—114½
121,275	,,	June 11	4	4	Do. 4 p.c. Deb.	99—104*	...	...
350,000	,,	Mar. 5	5½	5½	Swansea 5½ p.c. Red. Pref.	107—112	...	...
200,000	,,	June 11	6½	6½	Do. 6½ p.c. Red. Deb.	100—105*	...	...
1,076,490	,,	Mar. 5	6½	6½	Tottenham and District Ord.	150—155	...	152—155
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	126—131	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	115—120	+3	...
199,005	,,	June 11	4	4	Do. 4 p.c. Deb. ...	98—103*	+3	102
85,701	,,	Apl. 9	6	6	Tuscan, Ltd. 6 p c. Red. Db.	90—100	...	...
349,110	,,	Mar. 5	7	7	Uxbridge, &c., 5 p.c. ...	150—155	...	...
88,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	112—117	...	...
1,322,220	,,	Mar. 5	7	7	Wandsworth Consolidated	157—162	...	159½
1,096,378	,,	,,	5	5	Do. 5 p.c. Pref.	119—124	...	123½—124
1,317,964	,,	June 11	5	5	Do. 5 p.c. Deb.	120—125*	...	123
158,400	,,	Mar. 5	5	6g	Winchester W. & G. 5 p.c. Con.	115—120	...	...

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g.*—Paid £5, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

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THE Ormskirk District Gas Company intend to extend their Mains to enable them to Supply Gas to the Parish of Maghull, near Liverpool, and for that purpose require an immediate Loan of £10,000, and will issue MORTGAGES of their Undertaking for that amount bearing interest at the rate of FOUR POUNDS PER CENTUM PER ANNUM, repayable on the 1st day of January, 1960.

Applications for Mortgages of £100 or multiples of £100 to be sent to the undersigned on or before the 1st day of July next.

ALFRED DICKINSON,
Secretary to the Company.

Gas Offices,
Ormskirk,
June 20, 1934.

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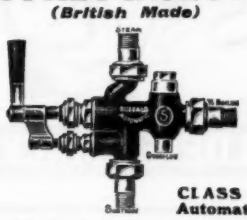

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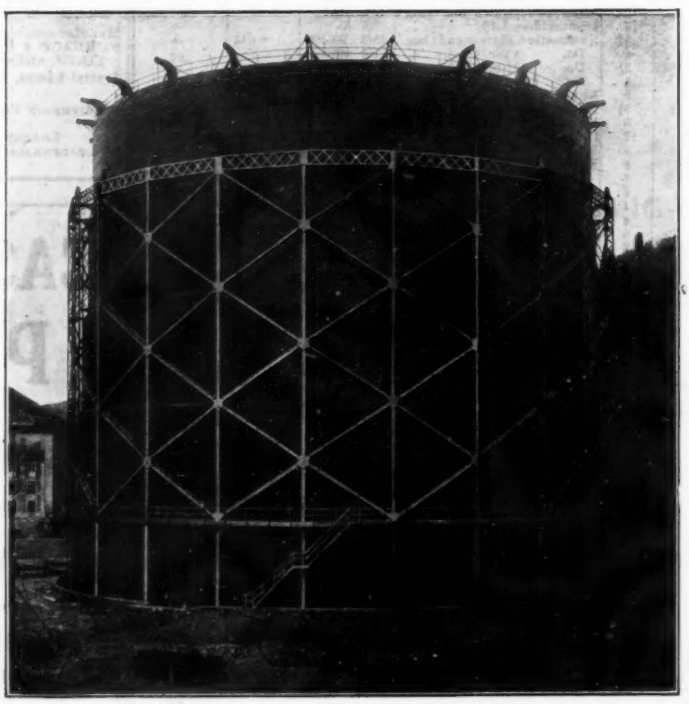

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(*See June 13, p. 710, and the "Gas Salesman."*)

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WANTED—A Gas Meter capable of measuring a total quantity of 25,000 Cu. Ft. per Hour of Coke Oven Gas at a temperature of approximately 50° C.
Please state Age of Meter and Price and Make to No. 8,437, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

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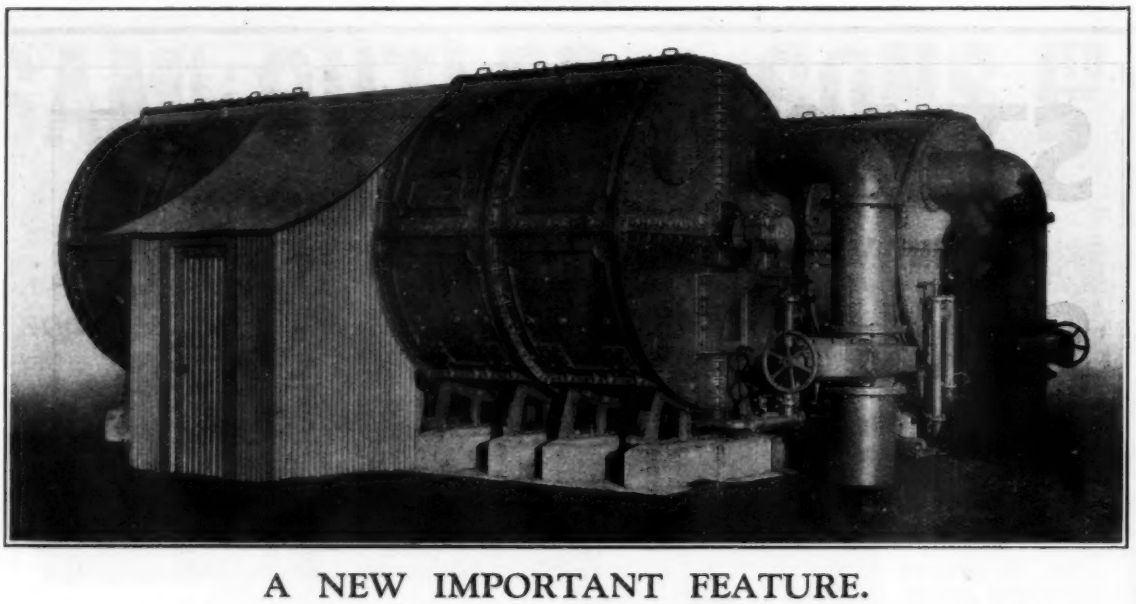
For further Small Adverts. see p. 922.



A NEW IMPORTANT FEATURE.

Dempster's Patent scrubbing medium is of light weight, thereby reducing wear on shafting—is easily removed and replaced—and eliminates all possibility of by-passing.

For the circulation of wash oil in the extraction of Benzole this improved machine ensures maximum efficiency and is equally effective for the recovery of Ammonia or elimination of Naphthalene.

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NEW SYSTEM OF BENZOLE RECOVERY

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101 C

APPOINTMENTS, &c., VACANT.

APPLICANTS for the Position of Distribution SUPERINTENDENT are hereby THANKED, and informed that AN APPOINTMENT HAS NOW BEEN MADE.

JAMES RILEY,
Secretary and Manager.
Rossendale Union Gas Company,
Cloughfold,
Rossendale, Lancs.

EXMOUTH GAS COMPANY.

DISTRIBUTION SUPERINTENDENT.

APPLICATIONS for the above Position are invited. Age not to exceed 35 years. Applicants must have Practical Experience in First-Class Distribution Work, and should be engaged in similar work at the present time.

Salesmanship and organizing abilities essential, and must be able to prepare estimates and advise Consumers on all matters relative to the Use of Gas.

Applications, stating Age, Experience, Qualifications, and Salary required, together with *copies* of recent Testimonials, to be sent to the undersigned not later than 6th July, 1934.

W. E. DEAN,
Managing Director.

URBAN DISTRICT COUNCIL OF WINDERMERE.

APPOINTMENT OF GAS AND WATER ENGINEER.

THE Council invite Applications for the Appointment of GAS AND WATER ENGINEER at an inclusive Salary of £340 per Annum, rising by annual increments of £20 to £400.

A motor car allowance of £25 per Annum will be paid, and a dwelling house, wherein the selected applicant must reside, will be provided at a rental of £25 per Annum; the tenant paying all outgoings.

The person to be appointed must have had a good Technical Training and previous Practical Experience in the work of a Gas and Water Undertaking.

Applications, on Forms to be obtained from the undersigned, must be accompanied by *copies* of not more than Three recent Testimonials, and delivered here not later than the 5th day of July, 1934, sealed and endorsed "Appointment of Gas and Water Engineer."

Canvassing, either directly or indirectly, will disqualify.

Stamped addressed foolscap envelope must accompany application for form.

THOMAS WATSON,
Clerk to the Council.

Ellerthwaite,
Windermere,
June 15, 1934.

DISTRIBUTION ENGINEER.

APPLICATIONS are invited for the Position of DISTRIBUTION ENGINEER for a Gas Undertaking in Australia at a commencing Salary of £550 per Annum (Annual Output about 1,000 million cub. feet).

Applicants must have had Gas-Works training, and must have thorough technical and commercial experience in Modern Distribution Practice.

Applicants must be capable of advising Architects, Builders, Commercial and Domestic Consumers on all kinds of Gas Apparatus and in the Uses of Gas for Industrial Purposes.

Applications, to be endorsed "Distribution Engineer," giving full particulars of Experience and Qualifications, present Employment, Age, and accompanied by photo, Medical Certificate, and not more than Three recent Testimonials, to be addressed, on or before the 28th July next, to No. 8,430, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

WANTED, for a Gas-Works in China (healthy climate), an ASSISTANT ENGINEER. Output, about 300 Millions. Age about 25 and unmarried. Must be well trained, good Carbonizer, and acquainted with Water Gas Plant.

Salary, £350 per Annum, with free quarters or house allowance in lieu thereof.

Apply, stating Experience and with Testimonials, to No. 8,439, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

APPOINTMENT WANTED.

BUSINESS Man of considerable Experience is available for APPOINTMENT. Originally Gas-Works trained. Is well known in the Industry, good Organizer, and Capable Salesman.

Address, No. 8,422, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

ARTICLED PUPIL.

A GAS Engineer in Yorkshire has a Vacancy for an ARTICLED PUPIL to be Trained in the Distribution and Utilization of Gas (Domestic and Industrial).

The Pupil will be required to study for the Examinations of the Institution of Civil Engineers and the Institution of Gas Engineers.

Application to No. 8,435, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

CONTRACTS OPEN.

BOROUGH OF KEIGHLEY.

(GAS DEPARTMENT.)

TENDERS are invited for the Supply of the following MATERIALS during the Twelve Months commencing September 1, 1934, viz.:

35,000 Tons SCREENED GAS COAL,
150 Tons NEW OXIDE OF IRON,

Also for the PURCHASE of about

300 Tons SPENT OXIDE

during the same period.

Prices are to be quoted delivered Gas-Works Sidings, Keighley.

Contractors will be required to conform to the Standing Orders of the Council relating to Contracts.

Forms of Tender can be obtained on application to Mr. Arthur Bromley, Gas Engineer, Gas Offices, Keighley.

Tenders, in plain sealed envelopes, endorsed Tenders for "Gas Coal," "Oxide of Iron," or "Spent Oxide," must reach the undersigned on or before July 4th, 1934.

The lowest or any Tender will not necessarily be accepted.

S. WALKER,
Town Clerk.

Town Hall,
Keighley.

CLACTON URBAN DISTRICT COUNCIL.

(GAS AND WATER DEPARTMENT.)

TENDERS are invited for the Manufacture and Supply of about 120 Tons of CAST IRON PIPES and SPECIALS to British Standard Specification, Class B.

Particulars may be obtained from Mr. Sydney Francis, M.B.E., A.M.I.Mech.E., Engineer and Manager, Gas and Water Department, Clacton-on-Sea.

Tenders, sealed and endorsed "Tender for Pipes," must be delivered to the undersigned not later than noon on Wednesday, 4th July, 1934. Tenders received without such endorsement will not be considered.

The Council do not bind themselves to accept the lowest or any Tender.

(Signed) GEO. T. LEWIS,
Clerk to the Council.

Town Hall,
Clacton-on-Sea,
June 23, 1934.

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G

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H

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I

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J

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K

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M

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O

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V

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W

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Walker, Crosweller, & Co., Ltd.	Wrapper IV.
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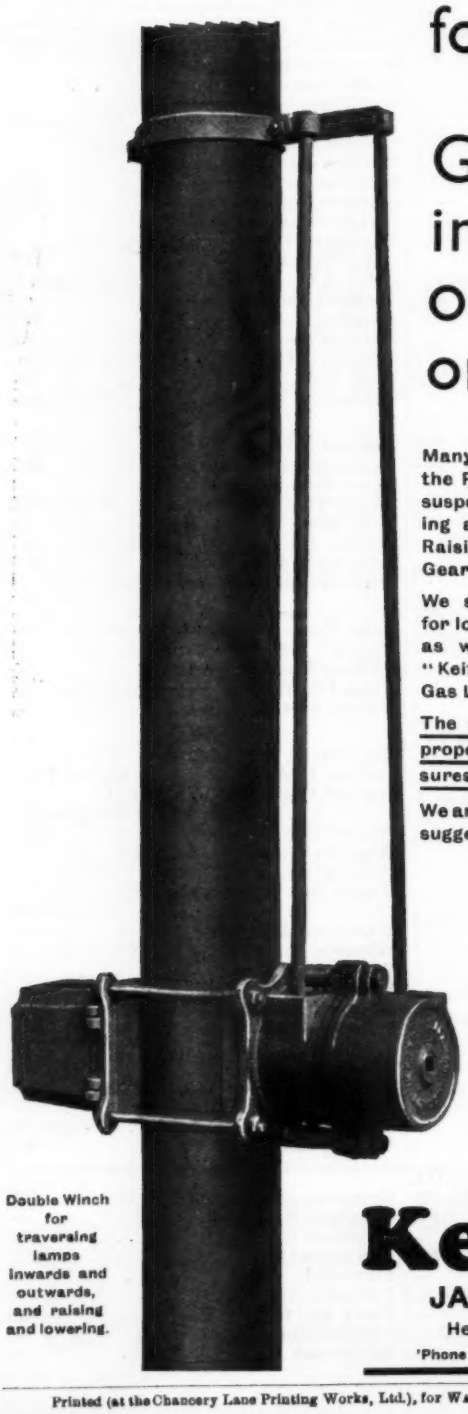

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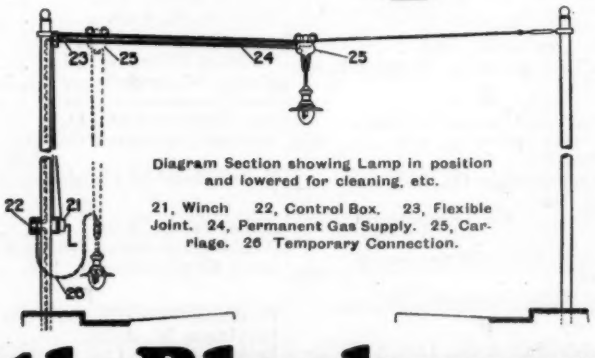

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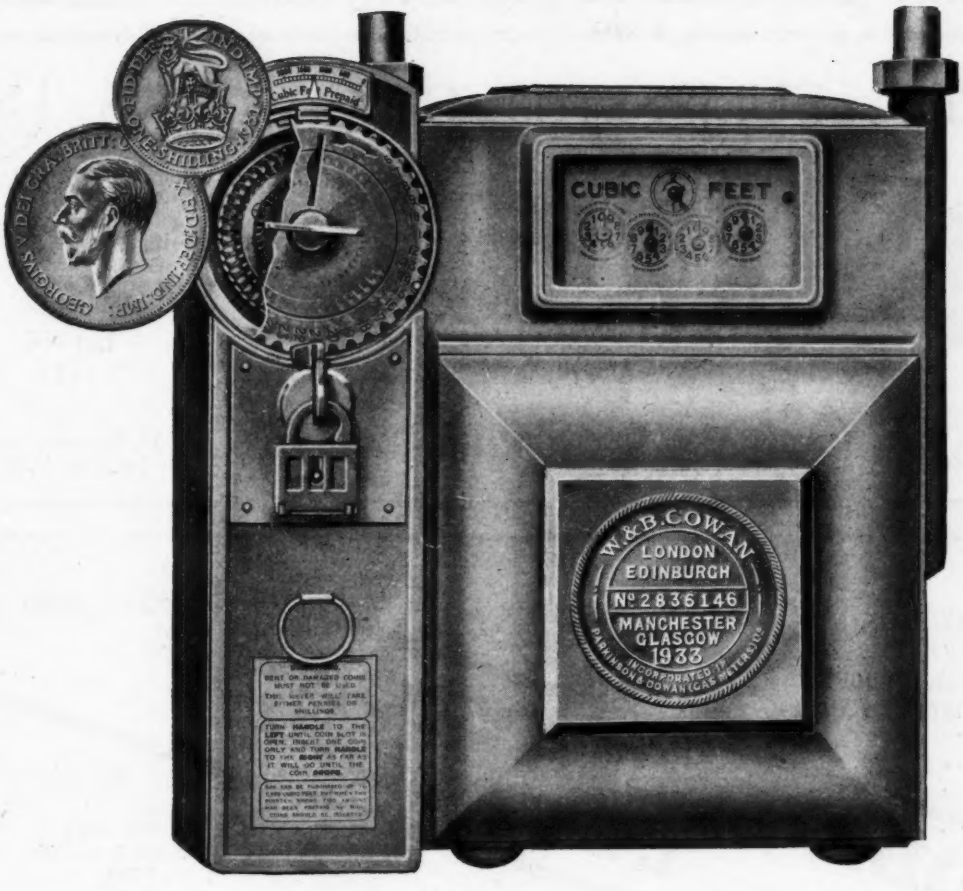

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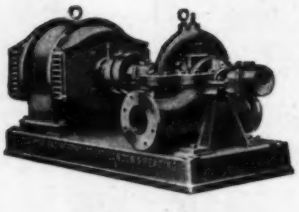

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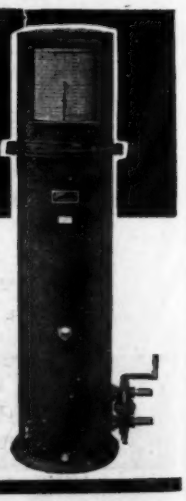

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